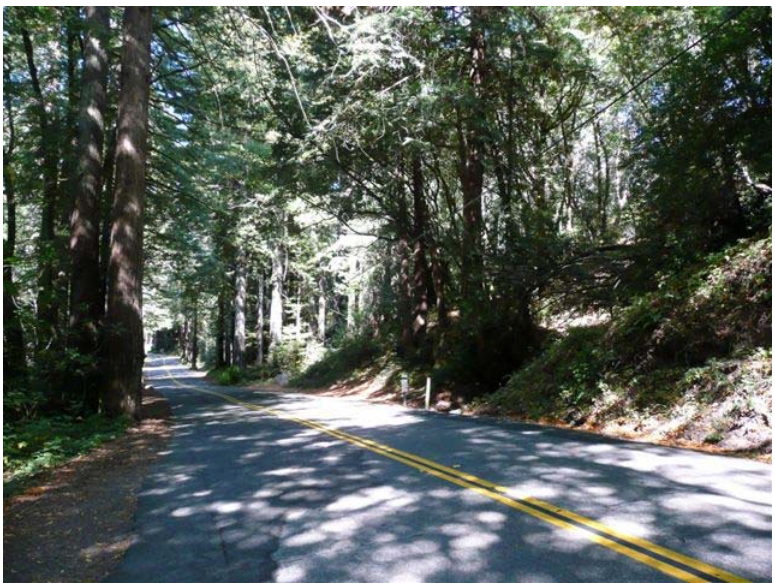
SIR FRANCIS DRAKE BOULEVARD REHABILITATION PROJECT FINAL ENVIRONMENTAL IMPACT REPORT



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Submitted to:

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CHAPTER 1.0
INTRODUCTION

1.1 PURPOSE OF THE EIR

In compliance with the California Environmental Quality Act (CEQA), this report describes the environmental consequences of the Sir Francis Drake Boulevard (SFDB) Rehabilitation Project proposed for Sir Francis Drake Boulevard between Shafter Bridge and Platform Bridge Road in the County of Marin. This Environmental Impact Report (EIR) is designed to inform County decision-makers, responsible agencies and the general public of the proposed project and the potential physical consequences of project approval. This EIR also examines alternatives to the proposed project and recommends mitigation measures to reduce or avoid potentially significant physical impacts. The County of Marin is the Lead Agency for environmental review of the proposed project. This EIR will be used by the County of Marin and the public in their review of the proposed project and associated approvals described in Chapter 3.0.

1.2 PROPOSED ACTION

The project considered in this EIR is the Sir Francis Drake Boulevard Rehabilitation Project (project). The project would rehabilitate a 5.2 mile section of SFDB between Shafter Bridge and Platform Bridge Road about one mile west of the Town of Lagunitas in unincorporated Marin County. The proposed project as designed avoids the need for tree removal except for some existing trees in the vicinity of an existing unstable slope. The following roadway improvements are proposed as part of the project:

- *Pavement Rehabilitation*. Pavement rehabilitation would involve the creation of a stable base layer (base course) over which two layers of asphalt would be applied using either a crack and seat technique or a milling method (see Chapter 3.0, Project Description, for further details on these two techniques).
- *Drainage Improvements*. A majority of the existing culverts located in the project site would be removed and replaced. Replacement culverts would generally be placed in the same alignment and grade as the existing culvert structures. In areas where erosion is present, the slope would be reconstructed and rip rap would be installed.
- *Roadway Pullouts*. Existing unpaved areas along SFDB that are used by vehicles to pull off the roadway would be closed by placing boulders or large rocks in these pullout locations to discourage stopping. New paved pullouts would be provided in appropriate locations and of adequate size and configuration to safely accommodate vehicles. These areas would be paved with permeable asphalt to limit sediment discharge and allow water to percolate.
- *Slope Repair*. An unstable slope condition is present near station number 270+25. In this location, approximately 200 feet of the shoulder and edge of roadway appear to have settled by as much as

two feet in some locations. To repair the roadway, installation of a pier-supported cantilevered tie-back concrete retaining wall is proposed at the roadway edge.

- *Other Roadway Improvements.* Where possible, modifications to the horizontal alignment would be made to ensure compliance with Caltrans design guidelines and American Association of State Highway Officials (AASHTO). To provide for additional shoulder width and to minimize the expansion of the roadway's grading limit, low retaining walls of no more than 3 feet in height would be provided. Retaining walls would be constructed from prefabricated, tinted concrete providing a wood-like appearance.

In addition to the project components described above, the environmental impacts of possible additional roadway improvements are being evaluated as Option A. These improvements may or may not be implemented as part of project construction, but the environmental impacts of the Option A improvements are evaluated in this ~~Draft~~ EIR. Under Option A, the roadway would be widened in some areas to provide additional shoulder area, a more uniform width and increased sight distance. To achieve uniform shoulder width, additional low retaining walls would be required and additional trees would be removed. Increased shoulder width cannot be achieved along the entire project alignment due to critical topographic constraints. Any further increase in roadway width beyond Option A would create the need to fill portions of Lagunitas Creek and to cut into the existing slopes. As the slopes are very steep, the volume of earthwork would be extensive. Furthermore, this would create the need to remove more existing trees. Accordingly no other road improvements were considered beyond those associated with the proposed project, including Option A.

1.3 CONTENTS OF THE EIR

This EIR is organized into the following chapters:

- *Chapter 1 – Introduction*: Discusses the overall EIR purpose, provides a summary of the proposed project and the environmental impact report scope, and summarizes the organization of the EIR.
- *Chapter 2 – Summary*: Provides a summary of the proposed project and the impacts that would result from implementation of the proposed project, and describes mitigation measures recommended to reduce or avoid significant impacts. A discussion of alternatives to the proposed project is also provided.
- *Chapter 3 – Project Description*: Provides a description of the project site, site development history, project objectives, required approval process, and details of the project itself.
- *Chapter 4 – Setting, Impacts and Mitigation Measures*: Describes the following for each environmental technical topic: existing conditions (setting); potential environmental impacts and their level of significance; and measures to mitigate identified impacts. Potential adverse impacts are identified by levels of significance, as follows: less-than significant impact (LTS), significant impact (S), and significant and unavoidable impact (SU). The significance of each impact (after mitigation) is categorized before and after implementation of any recommended mitigation measure(s).
- *Chapter 5 – Alternatives*: Provides an evaluation of two alternatives to the proposed project in addition to the No Project alternative.

- *Chapter 6 – CEQA Required Assessment Conclusions*: Provides additional specifically-required analyses of the proposed project's growth-inducing effects, significant irreversible changes, cumulative impacts, and effects found not to be significant.
- *Chapter 7 – Report Preparation*: Identifies preparers of the EIR, references used and persons and organizations contacted.

1.4 PUBLIC REVIEW AND COMMENTS

The County of Marin circulated a Notice of Preparation (NOP) notifying responsible agencies and interested parties that an EIR would be prepared for the project and indicating the environmental topics anticipated to be addressed in this EIR. The NOP was published on October 27, 2008. The NOP was mailed to public agencies, organizations, and individuals likely to be interested in the potential impacts of the project. Comments on the NOP were received by the County and considered during preparation of the EIR. A scoping session for the Draft EIR was held as a public meeting on November 15, 2009. A total of 53 comment letters regarding the NOP were received in addition to the verbal comments made at the public hearing. A summary table of written and oral comments received during the scoping period, and a reference to where the issue is addressed in the ~~Draft~~ EIR is included in Appendix A.

The following environmental topics are addressed in this EIR: Land Use and Policy Consistency, Aesthetics, Biological Resources, Cultural Resources, Geology and Soils, Hydrology and Water Quality, Hazards and Hazardous Materials, Traffic and Circulation, Air Quality, Noise, Public Services and Utilities, and Global Climate Change. Agricultural Resources, Mineral Resources, and Population and Housing will not be analyzed in detail in the EIR.

1.5 EIR PROCESS

The~~is~~ Draft EIR ~~will be~~was made available for review by public agencies, private organizations, and the general public for a 45-day comment period. The start date of the public comment period was~~is~~ included in the Notice of Completion (NOC). During the comment period, the public ~~is~~ was invited to submit written comments on the Draft EIR to the Marin County Department of Public Works. Comments on the Draft EIR ~~may be~~were submitted in writing to:

Mr. David Bernardi
Marin County Department of Public Works
3501 Civic Center Drive, Room 404
San Rafael, CA 94903

The Marin County Board of Supervisors ~~will also~~ schedule a public hearing to receive comments on the Draft EIR during, but before the close of, the 45-day public comment period. Notice of the public hearing ~~will be~~was provided in compliance with State Law and the County's procedures. The public ~~is~~ was invited to attend the public hearing to offer oral comments on the Draft EIR.

Following the close of the 45-day comment period, a Response to Comments document will be prepared to respond to all substantive comments received on the Draft EIR related to environmental issues surrounding the project. The Response to Comments document will also make revisions to the

Draft EIR, as necessary, in response to these comments or to clarify any previous errors, omissions, or misinterpretations of material in the Draft EIR.

The Response to Comments document, together with the Draft EIR, will constitute the Final EIR. Notice of the availability of the Final EIR will be provided in compliance with the Marin County Environmental Review Guidelines. The County's guidelines provide a period of 14 days for written comments to be submitted on the Final EIR. After the close of the 14-day comment period, a meeting will be scheduled before the Board of Superviors to consider certification of the Final EIR. Notice of the public meeting to consider certification of the Final EIR will be provided in compliance with State law and the County's procedures.

CHAPTER 2.0
SUMMARY

This section provides an overview of the analysis contained in Chapter 4.0, Setting, Impacts and Mitigation Measures. CEQA requires a summary to include discussion of: 1) potential areas of controversy; 2) significant impacts; 3) recommended mitigation measures; and 4) alternatives to the proposed project. As such, this section includes a brief synopsis of the proposed project and project alternatives, environmental impacts and mitigation measures, cumulative effects, areas of known controversy and issues to be resolved in the Environmental Impact Report (EIR). Table 2.11.A presents a summary of potential environmental impacts, their level of significance before mitigation, mitigation measures and levels of significance with mitigation.

2.1 SUMMARY OF THE PROPOSED PROJECT

This EIR has been prepared to evaluate the environmental impacts of the proposed Sir Francis Drake Boulevard Rehabilitation Project (project). The project would rehabilitate a 5.2 mile section of Sir Francis Drake Boulevard between Shafter Bridge and Platform Bridge Road about one mile west of the Town of Lagunitas in unincorporated Marin County. Project components include repaving the surface, replacing culverts, installation of low retaining walls, repairing the slope at Station 270+25, improvement of a limited number of formal pullouts, and closing a series of existing areas used as pullouts along the edge of the roadway. Under Option A, the roadway would be widened at selected locations to provide additional shoulder width and improved sight distance. A detailed description of the proposed project is provided in Chapter 3.0, Project Description.

2.2 SUMMARY OF SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

As discussed in Chapter 4.0 of this EIR, the proposed project would not result in any significant unavoidable impacts. Significant impacts have been identified in: aesthetics; biological resources; cultural resources; geology and soils; hydrology and water quality; hazards and hazardous materials; traffic and circulation; air quality; noise; and public services and utilities. However, these impacts can be reduced to a less-than-significant level with implementation of the mitigation measures identified in this EIR.

2.3 SUMMARY OF GROWTH INDUCING IMPACTS

Growth-inducing impacts of the proposed project are discussed in Chapter 6.0 of this EIR. The discussion concluded that, because the project would rehabilitate the existing roadway and would not provide increased capacity, the project would not have significant growth-inducing impacts.

2.4 SUMMARY OF CUMULATIVE IMPACTS

Chapter 6.0 of this EIR describes the environmental impacts of the proposed project in combination with projects in unincorporated Marin County. As described in Chapter 6.0, the project would have the following cumulative impacts:

Land Use and Planning Policy. The proposed project entails rehabilitation of an existing roadway; it does not propose any changes to land use. Therefore, the proposed project's incremental contribution to land use impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Aesthetics. The proposed project would alter the visual character of the project site through the removal of native trees and installation of retaining walls along sections of the roadway. Other cumulative projects could result in similar landscape changes in unincorporated Marin County, including the development of currently vacant land. However, due to the topography and their distance from the project area, these projects would have no effect on the viewshed encompassed by the proposed project. As described in Section 4.2, the proposed project's impacts to aesthetics are considered less than significant. Therefore, the proposed project's incremental contribution to aesthetic impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Biological Resources. Implementation of the proposed project would result in the loss of existing wetlands (roadside ditches) and could adversely affect the habitat and populations of special-status plant and animal species. Projects in Marin County planned for previously undeveloped sites could result in similar impacts to the habitat and population of protected plant and animal species. The project's impacts to these resources would be reduced to less-than-significant levels with implementation of the mitigation measures in Section 4.3, Biological Resources. In addition, drainage improvements proposed as part of the project would improve water quality over the existing condition by reducing sediments and pollutant concentrations in runoff in the long term. These improvements would have a beneficial effect on aquatic species in Lagunitas Creek. Therefore, the proposed project's incremental contribution to impacts on biological resources would not be cumulatively considerable and the cumulative impact would be less than significant.

Cultural Resources. Construction activities associated with the proposed project and other foreseeable projects, could result in significant impacts to archaeological and paleontological resources and human remains. The proposed project's impacts to these resources would be reduced to less-than-significant levels with implementation of the mitigation measures in Section 4.4, Cultural Resources. Other cumulative projects in the County would be subject to similar measures. Therefore, the proposed project's incremental contribution to impacts on cultural resources would not be cumulatively considerable and the cumulative impact would be less than significant.

Geology and Soils. The proposed project is located in an area that is subject to earthshaking, expansive soils, soil deformation, and landslides. The cumulative impacts associated with these geologic phenomena would be confined to the project vicinity and would be reduced to a less-than-significant levels with implementation of the mitigation measures recommended in Section 4.5, Geology and Soils. The geologic impacts of other cumulative projects in Marin County would be subject to similar measures. The project would have a beneficial effect on slope stability as it includes repair of retaining walls and the stabilization of some slopes along the roadway. Therefore, the

proposed project's incremental contribution to geologic and soils impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Hydrology and Water Quality. Construction and operation of the proposed project, combined with other cumulative projects, could generate stormwater runoff that could cause or contribute to a violation of water quality standards or waste discharge requirements or otherwise degrade the water quality of Lagunitas Creek. Compliance with the County's MCSTOPPP and SWPPP requirements would reduce these impacts to less-than-significant levels. The drainage improvements that are proposed as part of the project would reduce the volume of sediment and pollutants entering Lagunitas Creek (and ultimately Tomales Bay) and have a beneficial effect on water quality. Therefore, the proposed project's incremental contribution to hydrological and water quality impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Hazards and Hazardous Materials. Implementation of the proposed project and other cumulative projects could result in the localized release of hazardous materials used during construction activities. Compliance with federal, State and local hazardous materials regulations and fire safety regulations, and standard mitigation measures and conditions of approval would reduce cumulative impacts to less-than-significant levels. Therefore, the proposed project's incremental contribution to hazards or hazardous materials impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Transportation and Circulation. The proposed project would not generate additional permanent traffic on the roadway. Construction activities would create a marginal increase in traffic during project construction; this impact is considered less than significant. Other foreseeable projects in unincorporated Marin County could generate increased vehicle traffic along Sir Francis Drake Boulevard through the project area, contributing to cumulative traffic impacts. However, because the proposed project would not generate additional vehicle traffic, the proposed project will not contribute to cumulative traffic impacts. Construction activities associated with the proposed project could result in traffic delays, safety concerns and pavement damage created by construction traffic. Such impacts would be localized to the project area and would be reduced to less-than-significant levels with implementation of Mitigation Measure TR-1. Therefore, the proposed project's incremental contribution to transportation and circulation impacts would not be cumulatively considerable and the cumulative impact is less than significant.

Air Quality. As long-term traffic levels on the roadway would not increase as a result of the project, the project would not contribute to long-term air quality impacts. As described in Section 4.9, Air Quality, construction activities in the project area could result in increased dust fall and locally elevated levels of PM_{10} downwind of construction activity. Implementation of Mitigation Measure AIR-1 would reduce this impact to a less-than-significant level. Other projects in Marin County would be required to implement similar measures, consistent with guidance from the BAAQMD, to control construction period emissions. The proposed project's contribution to cumulative air quality impacts would not be considerable due to the implementation of Mitigation Measure AIR-1, which would reduce emissions of particulate matter resulting from project construction. Therefore, the proposed project's incremental contribution to air quality impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Noise. Long-term traffic levels on the roadway would not increase, and the rehabilitation of the roadway surface using ROC will reduce the level of noise currently generated by vehicle traffic on the existing deteriorated roadway surface. Therefore, the proposed project would not contribute to long-term noise levels in the project area. As described in Section 4.10, Noise, construction activities would result in a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. No other projects are currently proposed or under construction within the vicinity (1/4 mile) of the project site. Therefore, construction noise generated by the project would not be cumulatively considerable and the cumulative impact would be less than significant.

Public Services. Cumulative projects in Marin County could increase demand for police and fire services. However, these projects would be required to contribute their pro-rata share or other funding to the construction of new police and fire facilities in the County that would allow emergency responders to maintain adequate emergency response times. The project would rehabilitate an existing roadway and as described in Section 4.11, implementation of the proposed project would not require the expansion of fire protection, police services, schools, or parks. Therefore, the proposed project's incremental contribution to public services impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Implementation of the proposed project would not require the extension of water supply or wastewater conveyance infrastructure into the project site nor would it increase demand for water, wastewater treatment, or solid waste disposal. Potential impacts associated with the provision of portable restrooms during the construction period would be mitigated to a less than significant level with implementation of Mitigation Measure PS-1. Although on-site infrastructure improvements could be required to provide a range of utilities to cumulative projects in Marin County, associated impacts would generally be site-specific. Therefore, the proposed project's incremental contribution to public services and utilities impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Global Climate Change. As discussed in Section 4.12, Global Climate Change, the proposed project would emit GHG emissions only temporarily in association with project construction and would be consistent with applicable plans and policies for reducing GHG emissions with implementation of Mitigation Measure GCC-1. Therefore, the proposed project's incremental contribution to global climate change would not be cumulatively considerable.

2.5 SUMMARY OF PLAN AND POLICY CONSISTENCY

Section 4.1, Land Use, of this EIR presents an evaluation of the project's consistency with the Marin Countywide Plan, the Marin County Development Code (Zoning and Subdivision Regulations), and the Marin County Unincorporated Area Bicycle and Pedestrian Master Plan. That analysis concludes that the proposed project would be consistent with applicable policies and regulations (see Section 4.1 for details). The County decision-makers would need to review the project to determine whether the project is consistent with all policies and whether changes to the project would be required in order to provide the required consistency (see the subsequent discussion in Section 4.9 regarding Issues to Be Resolved for further discussion of these potential inconsistencies).

2.6 EFFECTS FOUND NOT TO BE SIGNIFICANT

Under CEQA, a significant effect on the environment is defined as: a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, noise, and objects of historic or aesthetic significance.[1]

As discussed in Chapter 4.0 of this EIR, implementation of the proposed project has the potential to result in adverse environmental impacts in several areas. Impacts associated with the following environmental topics would be significant without the implementation of mitigation measures, but would be reduced to a less-than-significant level if the mitigation measures recommended in this EIR are implemented:

- Aesthetics
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hydrology and Water Quality
- Hazards and Hazardous Materials
- Traffic and Circulation
- Air Quality
- Noise
- Public Services and Utilities
- Global Climate Change

Impacts associated with the following environmental topics would be considered less than significant and would not require any mitigation measures based on the identified criteria of significance:

- Land Use

2.7 SUMMARY OF ALTERNATIVES ANALYSIS

The following alternatives to the proposed project are considered in this EIR:

- The **No Project Alternative** assumes that the proposed roadway improvements would not be implemented. Existing traffic and roadway conditions would persist. The County would continue to maintain and repair the roadway on an as needed and ad hoc basis. The roadway design life would not be extended and safety would not be enhanced. Although some impacts associated with construction would be reduced or avoided by the smaller scale repairs of the roadway under the No Project Alternative, the environmental benefits of the project, such as slope stabilization measures to reduce erosion and slope failures and the drainage improvements to reduce the

[1] CEQA Sections 21060.5 and 21068.

volume of sediments and pollutants entering Lagunitas Creek, would not be recognized. In general, the No Project Alternative would not achieve the project objectives.

- The **Resurface Roadway Alternative** assumes that the roadway would be restored using the same pavement rehabilitation techniques described in Section 3.4.1 for the proposed project. The existing base course would be crushed, replaced and overlaid with two layers of asphalt concrete. The roadway would not be expanded to accommodate wider lanes or shoulders. No new formal pullouts or retaining walls would be constructed, existing locations along the roadway used as informal pullouts would not be closed, culverts would not be replaced, and slide repair would not be conducted under this alternative. The Resurface Roadway Alternative would partly achieve the project objectives. Under the Resurface Roadway Alternative, one of the environmental benefits of the Proposed Project – slope stabilization measures to reduce erosion and slope failures and the drainage improvements to reduce the volume of sediments and pollutants entering Lagunitas Creek – would not be achieved. The alternative would partially fulfill 'extend life of road' objective. It would extend the design life of the roadway to 20 years but would not provide the additional 30-year design life of the project.
- The **Mitigated Roadway Alternative** assumes that the roadway design would be modified to minimize impacts to site resources. The roadway would be rehabilitated and some sections of the alignment would be widened to accommodate wider vehicle lanes and/or shoulders. Under the Mitigated Roadway Alternative, Option A would be eliminated to minimize the number of trees to be removed. The Mitigated Roadway Alternative would achieve all objectives of the proposed project.

  The Mitigated Roadway Alternative would avoid the short-term visual impacts of the proposed retaining walls by removing most of the retaining walls from the project. Because Option A is removed in the Mitigated Roadway Alternative, nine fewer trees would be removed under this alternative, thereby reducing the tree impacts of the project and the need to replant mitigation trees in the watershed. The Mitigated Roadway Alternative would achieve all of the basic project objectives of the proposed project but would result in less paved road width in areas constrained by topography. Even though the proposed project does not result in any significant environmental impacts that cannot be mitigated, the Mitigated Roadway Alternative avoids the short-term visual impact of retaining wall construction and reduces the number of trees to be removed and associated mitigation by eliminating Option A. As a result, the Mitigated Roadway Alternative is considered the environmentally superior alternative.

  Please consult Chapter 5.0, Alternatives Analysis, for further discussion of these alternatives and other alternatives considered during development of this EIR.

2.8 AREAS OF CONTROVERSY

The potential areas of controversy surrounding the proposed project identified as part of the EIR scoping and Notice of Preparation (NOP) processes are evaluated in Chapter 4.0 of this EIR and are listed below. As part of the environmental review process, County decision makers will need to weigh these issues and concerns in reaching a final decision on the project.

- changes to viewsheds and the visual character of the project area
- impacts of grading

- effects on protected plant, animal, and aquatic species
- removal of wetlands and trees
- storm water runoff and treatment

2.9 SUMMARY OF MAJOR CONCLUSIONS

The following is a summary of the major conclusions set forth in the environmental analysis:

- The EIR identified a total of 29 project impacts as significant or potentially significant. As identified in Table 2.11.A, feasible mitigation is available to reduce all of these impacts to a less than significant level.
- Project implementation could result in direct and indirect impacts to federal and/or state listed salmonid species – Central California Coastal coho salmon, Central California Coast steelhead, and California Coastal chinook salmon. Mitigation measures are recommended in Section 4.3 of the EIR to protect water quality in Lagunitas Creek and minimize loss of salmonid individuals and their habitat. Measures include preparation and implementation of a Storm Water Pollution Protection Plan (SWPPP) and Storm Water Management Plan (SWMP), temporary construction fencing to protect riparian trees, and provision of suitable cuttings from the tree removal work for use as woody debris and in bio-engineered structures along Lagunitas Creek in order to enhance salmonid habitat. These mitigation measures would reduce potential impacts to salmonids to less-than-significant levels.
- Project implementation would result in the removal of 8 trees for slope repair at Station 270+25. Option A if implemented would result in the removal of 9 additional trees at various locations along the roadway. All trees that would be removed under the proposed project and Option A are protected under the Marin County Tree Protection Ordinance. Mitigation measures are recommended in Section 4.3 of the EIR to minimize tree loss and provide replacement trees for those that are removed. Measures include replanting of native trees at a 3:1 replacement ratio, financial contribution to the MMWD for support of habitat enhancement along Lagunitas Creek, and provision of suitable cuttings from tree removal work for use as woody debris and in bio-engineered structures along Lagunitas Creek. These mitigation measures would reduce the impact of tree loss to a less-than-significant level.
- Construction activities such as excavation and grading could affect a cultural resource, including an archaeological or paleontological resource, or human remains. Mitigation measures set forth in Section 4.4 would reduce potential impacts to a less-than-significant level
- Implementation of the proposed project would alter some of the engineering features, physical design characteristics, and natural setting of SFDB, a historical resource. Mitigation measures are recommended in Section 4.4 of the EIR to reduce the impact of proposed roadway improvements on the historic features of the portion of SFDB in the project area.
- Portions of the site are underlain by colluvium and residual soils that may be subject to heave and settlement in response to changing seasonal moisture conditions. The proposed project could be subject to significant impacts related to strong seismic ground shaking, seismic-related ground failure and/or seismically induced landslides. Mitigation measures identified in Section 4.5 would reduce potential impacts to a less-than-significant level.

- Construction activities, including placement of road material, grading, saw cutting, asphalt grinding, replacement of culverts, excavation, and tree removal, could result in discharge of sediment (and pollutants bound to sediment), asphalt materials, concrete, fuels, oils, paints, and solvents into Lagunitas Creek. Upon completion, the project would result in an increase in impervious area that would increase the surface area on which roadway pollutants could be deposited, come into contact with stormwater runoff, and discharge into Lagunitas Creek. Mitigation measures identified in Section 4.6 would reduce potential impacts to a less-than-significant level.
- Road construction activities would include the use of hazardous materials such as fuels, oils, lubricants, asphalt products, other petroleum products, and solvents. In addition, shallow soils disturbed during project construction could be affects by Aerially Deposited Lead (ADL), which could post a health risk to construction workers. Mitigation measures identified in Section 4.7 would reduce potential impacts to a less-than-significant level.
- Construction of the project would require temporary closure of one travel lane at a time, resulting in a temporary hazard to vehicles and bicycles, further pavement damage and disrupt Marin Transit service during the construction period. Mitigation measures identified in Section 4.8 would reduce potential impacts to a less-than-significant level.
- Temporary, localized emissions of Particulate Matter$_{10}$ (PM_{10}) during construction have the potential to exceed ambient air quality standards and contribute to regional violations of the ambient air quality standards. This potential impact would be reduced to a less-than-significant level through mitigation.
- Construction-period noise could be perceived as a nuisance to adjacent land uses, including open space/wildlife habitat, one residential unit, and recreational uses. Mitigation identified in Section 4.10 would reduce potential impacts to a less-than-significant level.
- Heavy equipment used during project construction could generate significant greenhouse gas emissions. Mitigation identified in Section 4.12 would reduce potential impacts to a less-than-significant level.

2.10 ISSUES TO BE RESOLVED

The primary issues to be resolved include the following:

- The Marin County Board of Supervisors will decide whether to adopt the project as proposed by the Marin County Department of Public Works, with or without Option A, or one of the alternatives identified in this EIR, or some combination of elements from the project and the alternatives. Based on the alternatives analysis, the Mitigated Roadway Alternative is the environmentally superior alternative and meets most/all of the project objectives. In reaching its decision the Board of Supervisors will also consider the mitigation measures proposed in the EIR as these measures can be adopted as conditions of project approval.
- Under Option A, the project proposes to widen selected sections of the roadway to provide additional shoulder width and improved sight distance. The Board of Supervisors will need to decide whether to approve the project with Option A.

2.11 SUMMARY TABLE OF IMPACTS AND MITIGATIONS

Table 2.11.A identifies impacts and mitigation measures associated with the proposed project. The information in the tables is organized to correspond with environmental issues discussed in Chapter 4.0. The table is arranged in four columns: (1) environmental impacts; (2) level of significance prior to mitigation measures; (3) mitigation measures; and (4) level of significance after mitigation. For a complete description of potential impacts and recommended mitigation measures, refer to Chapter 4.0, Setting, Impacts, and Mitigation Measures.

Table 2.11.A: Summary of Impacts and Mitigation Measures

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
4.1 LAND USE			
(1) Divide an Established Community	LTS	No mitigation is required.	
(2) Conflict with Applicable Plans, Policies and Regulations	LTS	No mitigation is required.	
(3) Conflict with a Habitat Conservation Plan or Natural Community Conservation Plan	LTS	No mitigation is required.	
(4) Convert Agricultural Land	LTS	No mitigation is required.	
(5) Conflict with Surrounding Land Uses	LTS	No mitigation is required.	
(6) Convert Open Space	LTS	No mitigation is required.	
(7) Conflict with Local Zoning	LTS	No mitigation is required.	
(8) Create Nuisance Impacts	LTS	No mitigation is required.	
4.2 AESTHETICS			
(1) Scenic Vista/Existing Viewshed	LTS	No mitigation is required.	
(2) Scenic Resources along a State Scenic Highway	LTS	No mitigation is required.	
(3) Existing Visual Character or Quality	LTS	No mitigation is required.	
(4) Reduction in Sunlight or Introduction of Shadows in Areas Used by the Public	LTS	No mitigation is required.	
(5) Conflict with County Goals or Policies	LTS	No mitigation is required.	
AES-1: Option A could increase the amount of light and glare visible to pedestrians, bicyclists and equestrians using the trail systems in the vicinity of the project area.	S	AES-1: The County shall identify those trees proposed for removal in Option A that currently shield campgrounds or trails from the light and glare of vehicles passing on SFDB. Prior to construction, the County shall include in its construction plans or designs, plantings, or other methods to reduce the potential impacts of vehicle glare and light impacts that would result from removal of these trees.	LTS
4.3 BIOLOGICAL RESOURCES			
(1) San Francisco Damselfly	LTS	No mitigation is required.	

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
(2) California Freshwater Shrimp	LTS	No mitigation is required.	
(3) Loss of Ruderal Habitat, Annual Grassland and Other Common Vegetation Communities	LTS	No mitigation is required.	
(4) Wildlife Movement Corridors	LTS	No mitigation is required.	
BIO-1: Implementation of the proposed project could impact special-status plant species present within the project area.	S	BIO-1: A qualified botanist shall conduct additional CDFG protocol-level surveys within and immediately adjacent to the zones that would be disturbed by construction work. The surveys shall be conducted in the year within which construction is to commence. To the extent allowed under the construction schedule, surveys shall be conducted during the flowering period of the special-status plants that have a high potential to occur within the project area (January through August). If any special-status plant species are observed within or adjacent to the disturbance zones, Marin DPW shall implement the following: • A qualified botanist shall delineate the locations of any special-status plant populations adjacent to the disturbance zones and shall supervise the installation of temporary protective construction fencing between the disturbance zones and the plant population. The fencing shall remain in place until construction is completed and all construction equipment has been removed from the vicinity. • If any special-status plant population is identified within the construction disturbance zones, the Marin DPW shall consult with CDFG and CNPS to determine appropriate avoidance and/or mitigation measures for impacts to the population. If the special status plant is federally listed as Threatened or Endangered, the Marin DPW shall also consult with the USFWS. At a minimum, avoidance and mitigation measures shall entail the following: a. Marin DPW shall adjust the boundaries of the disturbance zones, where feasible, to avoid impacts to the plant population.	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		b. Where avoidance is not feasible, the Marin DPW shall implement one or more of the following measures, based on the prior consultation with CDFG and CNPS: 1) transplant affected plants to suitable habitat areas outside the disturbance zones; 2) collect and properly store seeds of affected plants; subsequently re-seed suitable habitat areas outside the disturbance zones; 3) prepare and implement a long-term management/enhancement plan for existing off-site populations of the affected plant species.	
BIO-2: Implementation of the proposed project could impact special-status invertebrate species potentially present within the project area.	S	BIO-2a: During the spring and summer period prior to the start of construction, a qualified botanist shall conduct pre-construction surveys of the project site for the host plants of the Marin elfin butterfly and Myrtle's silverspot butterfly. Identified plant populations shall be marked for avoidance by project activities. If a plant population cannot be feasibly avoided, individual plants will be relocated by a qualified botanist to a location adjacent to the project disturbance zone.	LTS
BIO-2: *Continued*	S	BIO-2b: Implement re-vegetation and habitat restoration measures described in Mitigation Measures BIO-9a and BIO-9b.	LTS
BIO-3: Implementation of the proposed project could impact bird species protected under the Federal and State Endangered Species Act.	S	BIO-3a: Prior to initiation of construction activities (in April or May of the construction year) the Point Reyes Bird Observatory (PRBO) shall be contacted to obtain the results of any new spotted owl surveys that were conducted in the project vicinity. If such surveys indicate that spotted owls are nesting within 165 feet of the construction area, the USFWS and CDFG shall be consulted regarding additional avoidance and minimization measures.	LTS
BIO-3: *Continued*	S	BIO-3b: If construction work is scheduled during the breeding season (March 1 through August 30), a qualified wildlife biologist shall conduct pre-construction surveys of all suitable nesting trees in the project disturbance zone and within 165 feet of the disturbance zone to determine if nesting birds of either species are present. (Preconstruction surveys will not be required for construction work carried out in the non-breeding season August 30 through February 28/29.) The pre-construction surveys shall be conducted within 15 days prior to the start of work from March 1 through May 31 (since there is higher potential for birds to initiate nesting during this	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		period), and within 30 days prior to the start of work from June 1 through August 30. All suitable nesting trees within 165 feet of the construction disturbance zone will be surveyed. If active nests of either species are found in the work area, the USFWS and CDFG will be consulted as to appropriate avoidance and minimization measures prior to the initiation of work. At a minimum, the following avoidance and minimization measures shall be implemented: a. In order to avoid and minimize impacts on nesting northern spotted owls during project implementation, a 165-foot buffer shall be established around active nesting sites. No project construction activities shall be allowed to occur within this zone until a qualified biologist has determined that all juveniles have fledged from occupied nests. b. Buffer zones shall be clearly delimited using construction fencing or other suitable barrier material to the extent feasible based on site conditions. c. Construction activity, site access by equipment and vehicles, and operations at the staging areas shall be limited to daytime hours. No nighttime work shall be allowed on the project. Activities shall begin no earlier than one-half hour after sunrise and shall end no later than one-half hour before sunset. d. Any required tree trimming of trees to be avoided shall be done according to arborist guidelines to minimize the effects to trees. Trimming of trees must not jeopardize the survival of trees. e. A report documenting the results of preconstruction surveys and nest protection and monitoring shall be provided to USFWS and CDFG within 4 weeks of completion of work in the vicinity of active nests.	

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
BIO-4: Implementation of the proposed project could impact special-status bird species protected under the MBTA potentially nesting in and adjacent to the project area.	S	BIO-4: If construction work is scheduled during the breeding season (March 1 through August 30), a qualified wildlife biologist shall conduct pre-construction surveys within and adjacent to the project disturbance zone to determine if nesting birds are present. (Preconstruction surveys shall not be required for construction work carried out in the non-breeding season August 30 through February 28/29.) The pre-construction surveys shall be conducted within 15 days prior to the start of work from March 1 through May 31 (since there is higher potential for birds to initiate nesting during this period), and within 30 days prior to the start of work from June 1 through August 30. If active nests are found in the work area, the biologist shall determine an appropriately sized buffer around the nest in which no work shall be allowed until the young have successfully fledged. The size of the nest buffer shall be determined by the biologist in consultation with the CDFG, and shall be based on the nesting species, the context of the nest site in relation to existing human activity and its sensitivity to disturbance, and the expected types of disturbance. No project construction activities shall be allowed to occur within this zone until a qualified biologist has determined that all juveniles have fledged from occupied nests. At a minimum, the following buffer zones shall be implemented: • *Yellow Warbler.* Yellow warblers typically nest and rear young from April through July. In order to avoid and minimize impacts on nesting yellow warblers during project implementation, a 25 to 50-foot buffer shall be established around active nesting sites when project activities shall occur during their breeding and nesting period. No project activities shall be allowed to occur within this zone. The buffer area can be removed prior to July if a qualified biologist determines that all juveniles have fledged from occupied nests. • *Osprey.* Osprey typically nest and rear young from March through September. In order to avoid and minimize impacts on nesting osprey during project implementation, a 200-foot buffer	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		shall be established around active nesting sites when project activities shall occur during their breeding and nesting period. No project activities shall be allowed to occur within this zone. The buffer area can be removed prior to September if a qualified biologist determines that all juveniles have fledged from occupied nests. • *Other Raptor Species.* Other raptor species typically nests and rear young from early April through August. If these species are found to be nesting, impacts shall be avoided and minimized by establishing a 200-foot buffer around active nest sites. No project related activities should be allowed to occur within this buffer until young have fledged or the species are no longer attempting to nest. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests. • *Other Migratory Birds.* Migratory bird species typically nest and rear young from February through August. In order to avoid and minimize impacts on migratory bird species, a 25 to 200-foot buffer shall be established around active nesting sites when construction activities shall occur during their active nesting period. No project-related activities shall occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests. A report documenting the results of preconstruction surveys and nest protection and monitoring shall be provided to CDFG within 4 weeks of completion of work in the vicinity of active nests.	
BIO-5: Implementation of the proposed project could impact federal and/or state listed salmonid species - Central California Coastal coho salmon, Central California Coast steelhead, and California Coastal chinook salmon.	S	BIO-5a: In accordance with Mitigation Measure HYD1a, a Storm Water Pollution Protection Plan (SWPPP), in accordance with the State Water Resources Control Board, National Pollution Discharge Elimination System (NPDES) Construction General Permit, shall be prepared and implemented.[2] The SWPPP shall include a wide range	LTS

[2] See Section 4.6.2 and Mitigation Measure HYD-1 under *Hydrology and Water Quality* for further details on SWPPP requirements as they relate to the proposed project.

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		of Best Management Practices (BMPs) for controlling sediment and turbidity during construction. These BMP should include the following measures to avoid impacts to salmonids: • Work below the tops of the creek banks, including culvert replacement work in the tributaries and bank repair along Lagunitas Creek, shall be allowed only during the period from June 15 to October 15 during low flow conditions. Culvert replacement work in a tributary shall occur only when there is no flow in the tributary or when in the opinion of the project biologist, the flow is too low to allow salmonid passage through the culvert. Low tributary flows will be temporarily captured and diverted downstream from the work zone. • No fill material, including asphalt or concrete, shall be allowed to enter the stream. Any concrete structures (such as culvert headwall construction) below the tops of banks shall be poured in tightly sealed forms and shall not be allowed contact with surface waters until the cement has fully cured. Poured concrete shall be excluded from the wetted channel for a period of 30 days after it is poured. During that time the poured concrete shall be kept moist, and runoff from the concrete shall not be allowed to enter the creek. Commercial sealants may be applied to the poured concrete surface where difficulty in excluding water flow for a long period may occur. If sealant is used, water shall be excluded from the site until the sealant is dry and fully cured according to the manufacturer's specifications. • Water that contacts wet concrete and has a pH greater than 9.0 shall be pumped out and disposed of outside the creek channel. • No substances toxicto aquatic life shall be discharged into ~~Laguniats~~ Lagunitas Creek or its tributaries. • There shall be no material deposition nor other channel disturbance below the ordinary high water line of Lagunitas Creek.	

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		• There shall be no coffer dams or dewatering of Lagunitas Creek. • Hydroseed mixes used to stabilize disturbed areas shall not contain fertilizers. • Equipment maintenance and fueling areas shall be located at least 100 feet away from the creek bank. Fueling must be behind a containment barrier that shall prevent any spilled or leaked fuel from running into the creek. All equipment servicing must occur within designated areas. All motorized equipment used during construction or demolition activities shall be checked for oil, fuel, and coolant leaks prior to initiating work. Any equipment found to be leaking fluids shall not be used in or around aquatic habitat features in order to minimize the chances of contaminating the habitat and potentially impacting sensitive species, particularly salmon and steelhead. • The project's contractor shall prepare an emergency response and clean-up plan prior to beginning work at the site. The plan shall detail the methods to be used to contain and clean-up spills of petroleum products or other hazardous materials in the work area. • All maintenance crew personnel shall receive environmental training about the sensitive nature of the special status species in the project vicinity. This training that shall include descriptions of the special status species and all project measures in place to protect the species during construction. Crews shall also be informed to stop all work and notify their supervisor or the project biologist if special-status species are observed within the project site.	
BIO-5: *Continued*	S	BIO-5b: Post-construction (ongoing) road maintenance, including inspection and maintenance of roadside bioswales, shall be conducted in accordance with a long-term Storm Water Management Plan (SWMP) prepared prior to the start of construction in accordance with RWQCB and Marin County Stormwater Pollution Prevention	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		Program (MCSTOPPP) standards, and approved by the RWQCB and Marin County. The SWMP shall also incorporate county road maintenance BMPs contained in the Fish Net 4C BMPs Roads Manual. [3]	
BIO-5: *Continued*	S	BIO-5c: In order to avoid damage to existing riparian trees in the vicinity of the construction site, all native trees with trunks adjacent to excavation areas, equipment staging and material storage areas, as well as other areas with concentrated activity by construction equipment, shall be protected with temporary construction fencing. The fencing shall be placed at the edge of the construction zone as close as feasible to the edge of the tree driplines. No construction work, storage of equipment or materials or other disturbance shall be allowed within the protected areas. Additionally, redwood trees in the vicinity of the construction site shall be protected in accordance with Mitigation Measures BIO-10a through BIO-10i.	LTS
BIO-5: *Continued*	S	BIO-5d: Marin DPW shall make available suitable cuttings from the tree removal work for use as woody debris and in bio-engineered structures along Lagunitas Creek in order to enhance salmonid habitat. The Marin DPW shall notify the signatories to the February 7, 2007 *Memorandum of Understanding for Woody Debris Management in Riparian Areas of the Lagunitas Creek Watershed* (Marin Municipal Water District, Marin County Open Space District, California Department of Parks and Recreation, National Park Service, and the Marin County Resource Conservation District – see *Biological Assessment* – Appendix E) of the availability of the wood, and the signatories shall notify Marin DPW if they have use for the woody debris, and when they will collect the material. If the signatory agencies have not responded within 14 days Marin DPW shall dispose of the material in a legal manner.	LTS
BIO-6: Implementation of the proposed project could impact other special-status fish species.	S	BIO-6: Implement measures to protect special-status salmonids described in Mitigation Measures BIO-5a through BIO-5d.	LTS
BIO-7: Implementation of the proposed project could impact special-status amphibian and reptile species potentially present within the project area.	S	BIO-7a: Prior to work beginning in any habitats containing appropriate habitat for northwestern pond turtle, foothill yellow-legged frog, or California red-legged frog a qualified biologist shall	LTS

[3] See Section 4.6.2 under *Hydrology and Water Quality* for further details on the MCSTOPPP requirements for compliance with RWQCB NPDES General Permit.

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		conduct focused pre-construction surveys for these species. The Preconstruction surveys for California red-legged frog shall be completed within 48 hours prior to commencement of any earth-moving activity, construction, or vegetation removal, whichever comes first. The preconstruction survey shall include two nights of nocturnal surveys in areas of suitable habitat. The biologist performing the preconstruction survey must hold a federal 10(a)(1)(A) permit for California red-legged frog or be considered by USFWS to be a "service approved" biologist. If any of the above special-status amphibian and reptile species are encountered during the surveys, all work in the work area shall be placed on hold while the findings are reported to the CDFG and USFWS and it is determined what, if any, further actions must be followed to prevent possible take of this species.	
BIO-7: *Continued*	S	BIO-7b: Where construction would occur in habitat where California red-legged frogs, foothill yellow-legged frogs, and northwestern pond turtle are potentially present, work areas shall be fenced in a manner that prevents equipment and vehicles from straying from the designated work area into adjacent habitat areas. An authorized biologist shall assist in determining the boundaries of the area to be fenced in consultation with the USFWS, and CDFG. All workers shall be advised that equipment and vehicles must remain within the fenced work areas. The authorized biologist shall direct the installation of the fence and shall conduct biological surveys to move any individuals of these species from within the fenced area to suitable habitat outside of the fence. Exclusion fencing shall be at least 24 inches in height. The type of fencing must be approved by the authorized biologist, the USFWS, and CDFG.	LTS
BIO-6: *Continued*	S	BIO-7c: If, at any time, individuals of these species are found within an area that has been fenced to exclude these species, activities shall cease until the authorized biologist moves the individuals.	LTS
BIO-7: *Continued*	S	BIO-7d: If any of these species are found in a construction area where fencing was deemed unnecessary, work shall cease until the	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		authorized biologist moves the individuals. The authorized biologist in consultation with USFWS and CDFG shall then determine whether additional surveys or fencing are needed. Work may resume while this determination is being made, if deemed appropriate by the authorized biologist.	
BIO-7: *Continued*	S	BIO-7e: Clearance surveys of the construction area shall occur on a daily basis in the work area. Any individuals of these species found during clearance surveys or otherwise removed from work areas shall be placed in nearby suitable, undisturbed habitat. The authorized biologist shall determine the best location for their release, based on the condition of the vegetation, soil, and other habitat features and the proximity to human activities. The authorized biologist shall have the authority to stop all activities until appropriate corrective measures have been completed.	LTS
BIO-7: *Continued*	S	BIO-7f: To ensure that diseases are not conveyed between work sites by the authorized biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force[4] shall be followed at all times.	LTS
BIO-7: *Continued*	S	BIO-7g: Project activities shall be limited to daylight hours, except during an emergency, in order to avoid nighttime activities when California red-legged frogs may be present.	LTS
BIO-7: *Continued*	S	BIO-7h: Within the work zone,traffic speed shall be maintained as required by the Manual for Uniform Traffic Control Devices – California edition. The speed limit in the work zone shall be no more than 15 MPH.	LTS
BIO-7: *Continued*	S	BIO-7i: BMPs and erosion control methods, as outlined in the project's SWPPP, shall be implemented. These BMPs include re-vegetation of all bare soil prior to the rainy season to prevent an increase in sediment entering waterways. The project's SWPPP shall be subject to the review and approval of the USFWS and CDFG.	LTS
BIO-8: Implementation of the proposed project could impact special-status mammal species potentially present within the project area.	S	BIO-8a: All trees to be removed within the project area shall be surveyed for the presence of bat roosts by a qualified biologist. Surveys may entail direct inspection of the trees or nocturnal surveys. The survey shall occur no more than 2 weeks prior to the initiation of	LTS

[4] http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/DAFTA.pdf

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		vegetation removal and ground disturbing activities. The survey shall be conducted prior to the commencement of the bat maternity season (approximately April 15-August 15). If no roosting habitat is present, then the tree must be removed within 1 week following the survey. If roosting habitat is present and occupied, then a qualified biologist shall determine the species of bats present and the type of roost (i.e., day roost, night roost, maternity roost). If it is determined that the bats are not a special-status species, and that the roost is not being used as a maternity roost, then the bats may be evicted from the roost using methods developed by a biologist experienced in developing and implementing bat mitigation and exclusion plans.	
BIO-8: *Continued*	S	BIO-8b: If special-status bat species are found to be present or if the roost is determined to be a maternity roost for any species of bat, then a qualified biologist experienced in developing bat mitigation and exclusion plans shall develop a mitigation plan to compensate for the lost roost site. Removal of the roost shall only occur when the mitigation plan has been approved by CDFG and only when bats are not present in the roost. The mitigation plan shall detail the methods of excluding bats from the roost and the plans for a replacement roost in the vicinity of the project site. One replacement roost shall be provided for each roost impacted. The mitigation plan shall be submitted to CDFG for approval prior to implementation. The plan shall include: (1) a description of the species targeted for mitigation; (2) a description of the existing roost or roost sites; (3) methods to be used to exclude the bats if necessary; (4) methods to be used to secure the existing roost site to prevent its reuse prior to removal; (5) the location for a replacement roost structure; (6) design details for the construction of the replacement roost; (7) monitoring protocols for assessing replacement roost use; (8) a schedule for excluding bats, demolishing of the existing roost, and construction of the replacement roost; and (9) contingency measures to be implemented if the replacement	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		roosts do not function as designed.	
BIO-8: *Continued*	S	BIO-8c: Roosts shall only be removed during seasons when bats are active and the young are able to fly (March 1 – April 15, and August 1 – October 15).	LTS
BIO-8: *Continued*	S	BIO-8d: Removal of trees surrounding roost trees shall be conducted in a manner to prevent the tree being removed from falling on or otherwise damaging the roost tree.	LTS
BIO-8: *Continued*	S	BIO-8e: No diesel or gas-powered equipment shall be stored or operated directly beneath a roost site.	LTS
BIO-8: *Continued*	S	BIO-8f: Under supervision of a qualified bat expert, roost trees shall be removed in two steps, over two successive days: . Branches and limbs identified by the bat expert should be removed on Day 1 (Disturbance). . The remainder of the tree should be removed on Day 2 (Removal).	LTS
BIO-8: *Continued*	S	BIO-8g: All construction activity in the vicinity of an active roost shall be limited to daylight hours.	LTS
BIO-8: *Continued*	S	BIO-8h: A preconstruction survey of the project area and the area within 100 feet of the project areas shall be conducted for the presence of the badger dens and signs of badger occupancy. The survey shall be completed no more than 7 days prior to the initiation of vegetation removal and ground disturbing activities. If no dens are observed, a second survey shall be conducted within 24 hours of vegetation removal and ground disturbing activities to ensure that no badgers have entered the area since the first survey. Preconstruction surveys shall be repeated as necessary if vegetation removal and ground disturbing activities are delayed or postponed.	LTS
BIO-8: *Continued*	S	BIO-8i: If potential dens are observed within the project area or 100 foot buffer area, then the project shall implement a monitoring program to determine if the dens are active. Monitoring shall be performed using remote triggered cameras or tracking medium placed at the den entrance. Cameras or tracking medium shall be operated for a minimum of 3 nights. If no activity is observed at the den during the monitoring period, the den shall be excavated by hand on the	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		morning following the third night of monitoring. The den shall be backfilled to prevent reuse. All den excavations shall be coordinated with the CDFG. If a den is determined to be active, the den shall be monitored for an additional 3 nights to determine if the badgers are using the den continually. Special care shall be taken during the period of March through July when badger cubs may be present in the den. Excavation of natal dens shall not be allowed until it is determined by a qualified biologist that the young have left the den and are able to forage independently. The presence of a natal den within the project area or buffer area shall be reported to CDFG within 24 hours.	
BIO-8: *Continued*	S	BIO-8j: During all times of the year, no excavation of the dens shall be allowed until monitoring results demonstrate that the den has been unoccupied for at least 3 nights. Once the den has been determined to be unoccupied for a period of at least 3 nights, the den may be excavated by hand and backfilled.	LTS
BIO-8: *Continued*	S	BIO-8k: Outside of the period when young may be present in the den (August through February), measures may be taken to discourage the use of continually occupied dens. This discouragement may include blocking the entrance to the den or other methods approved by CDFG. The den must be continually monitored during this period to ensure that badgers are not occupying the den. Excavation and backfilling may occur once the den is determined to be unoccupied for at least 3 nights. A report documenting the results of preconstruction surveys and den monitoring shall be reported to CDFG within 2 weeks of completion of the den excavations and initiation of vegetation removal and ground disturbance activities.	LTS
BIO-9: Implementation of the proposed project would impact native trees protected by the Marin County Tree Preservation Ordinance present within the project area.	S	BIO-9a: Marin DPW shall comply with the requirements of the Marin County Tree Protection Ordinance for any tree loss under the proposed project including retaining wall work at Station 270+25 and all tree removal under Option A. Consistent with the ordinance, trees of the same species as those impacted shall be replanted at a 3:1 replacement ratio. The replacement trees shall be 15-gallon specimens unless a certified arborist or a representative from the MMWD determines otherwise. Planted trees shall be maintained with	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		browse protection and weed cloth around the root zones as needed, and regularly watered during the dry season until such time that a certified arborist has determined that they are sufficiently established to not require further maintenance or watering. Replanted trees shall be planted within the Lagunitas Creek watershed if possible. One suitable location for tree replanting is the drilled-pier retaining wall structure located immediately downstream from the Peters Dam plunge pool (see Biological Assessment – Appendix E). MMWD constructed this wall to protect a pipeline that was endangered by a landslide along a 160-foot section of stream bank in 2005. MMWD would like to replant the stream bank below the retaining wall with native trees and shrubs, including redwood trees. The area to be planted would qualify as mitigation if Marin DPW paid for or did the planting. Prior to the start of roadway construction, DPW shall identify the final planting location(s) and receive approval from MMWD if necessary. If suitable re-planting location(s) cannot be found and agreed to by the affected public agency property owners, then DPW may contribute the required monetary amount into the Marin County Tree Preservation Fund, as specified under the tree protection ordinance.	
BIO-9: *Continued*	S	BIO-9b: In order to compensate for the potential habitat impacts from tree removal along Lagunitas Creek, Marin DPW shall implement the following additional mitigation measures: • Marin DPW shall provide a financial contribution to the MMWD for support of habitat enhancement along Lagunitas Creek under the MMWD *Mount Tamalpais Watershed Gateway Project.* The appropriate amount of the contribution shall be directly related to the degree of removed habitat and shall be determined by Marin DPW in consultation with MMWD and shall be specifically dedicated to either invasive exotic vegetation management and/or native plant revegetation efforts along the creek.	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		• Marin DPW shall make available suitable cuttings from the tree removal work for use as woody debris and in bio-engineered structures along Lagunitas Creek in order to enhance salmonid habitat. The Marin DPW shall notify the signatories to the February 7, 2007 *Memorandum of Understanding for Woody Debris Management in Riparian Areas of the Lagunitas Creek Watershed* (Marin Municipal Water District, Marin County Open Space District, California Department of Parks and Recreation, National Park Service, and the Marin County Resource Conservation District – see *Biological Assessment* - Appendix E) of the availability of the wood, and the signatories shall notify Marin DPW if they have use for the woody debris, and when they will collect the material. If the signatory agencies have not responded within 14 days Marin DPW shall dispose of the material in a legal manner.	
BIO-10: Implementation of the proposed project would impact root of redwoods and other native trees present within the project area.	S	BIO-10a: An arborist certified by the International Society of Arboriculture (ISA) shall be present for any ground disturbing construction activities within a 50-foot radius of any redwood tree and within the dripline of other native trees to monitor compliance with Mitigation Measures BIO-10b through 10i.	LTS
BIO-10: *Continued*	S	BIO-10b: All excavation work below the finish grade within a 50-foot radius of any redwood tree shall be done with hand tools or with light mechanized equipment such (e.g., mini or light excavator or backhoe) to minimize disturbance or damage to roots.	LTS
BIO-10: *Continued*	S	BIO-10c: The contractor shall use an air spade while excavating the soil within the structural root zone of native trees to minimize physical injury to the tree roots. The contractor may propose alternative excavation methods that would minimize root damage, subject to the approval of the certified arborist and Marin DPW.	LTS
BIO-10: *Continued*	S	BIO-10d: Smaller roots less than 2-inches in diameter requiring cutting shall be cut cleanly in order to promote healing.	LTS
BIO-10: *Continued*	S	BIO-10e: The structural section for new pavement shall consist of Cement Treated Permeable Base (CTPB) or the equivalent to minimize the thickness of the structural section, minimize compaction of roots, and minimize thermal exposure to roots.	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
BIO-10: *Continued*	S	BIO-10f: In areas where soil would be excavated through the roots of native trees for culvert replacement, retaining wall construction or other purposes, the following measures shall be used to protect roots and promote air circulation: • The existing vegetation needing removal shall be cut flush with the ground and stumps left in place. Stumps shall not be treated with herbicides or other chemicals. • Any duff layer shall be hand raked off the area within the clearing limits, stored, and replaced as erosion control. • A 0.75 foot thick layer of Class 1, Type A porous material shall be placed and compacted as the first lift of the fill to increase water infiltration and air circulation. A layer of filter fabric shall then be applied prior to placing the remaining fill required for the embankment. • In locations where fill would be placed next to the trunk of a redwood tree greater than three feet in diameter, a brow log shall be used to keep the soil from the tree trunk to increase air circulation.	LTS
BIO-10: *Continued*	S	BIO-10g: Equipment staging areas/storage areas shall be on existing paved areas on existing areas of compacted, gravel surface not located within 50 feet of redwood trees.	LTS
BIO-10: *Continued*	S	BIO-10h: No heavy equipment shall be staged or parked within the drip line of mature trees in unpaved areas. Fill, gravel or other construction materials shall not be stockpiled within 50-feet of redwood trees or beneath the driplines of any other trees.	LTS
BIO-10: *Continued*	S	BIO-10i : In order to avoid adversely altering surface drainage patterns over redwood root zones, bioswales and other drainage swale features shall be located on the upslope side of SFDB (opposite side from Lagunitas Creek) wherever feasible.	LTS
BIO-11: Implementation of the proposed project would impact seasonal wetlands and other waters present within the project area.	S	BIO-11a: Prior to project implementation, Marin DPW shall obtain all required regulatory permits to conduct work activities in wetlands and streams. Permits required to conduct these activities include a Section 401 Water Quality Certification from the Regional Water	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		Quality Control Board (RWQCB), a Section 404 permit from the USACE, and a Lake and Steambed Alteration Agreement from CDFG.	
BIO-11: *Continued*	S	BIO-11b: Marin DPW shall compensate for the loss of 0.24 acres of seasonal wetlands associated with the filling of roadside swales by establishing new seasonal wetlands at a 2:1 on-site replacement ratio within the Lagunitas Creek watershed in the vicinity of the SFDB project. One possible mechanism for accomplishing this may be for the DPW to fund the establishment of at least 0.48 acres of new floodplain wetland habitat along Lagunitas Creek in association with the MMWD *Lagunitas Creek Salmon Winter Habitat Enhancement Program*. This program seeks to address a possible limiting factor to the survival of juvenile coho salmon - a lack of suitable winter habitat along the creek, by establishing new side channels and backwater wetlands on selected reaches of the floodplain. The following is a brief summary of the proposed mitigation plan: • **Mitigation Location.** Tocoloma Reach of Lagunitas Creek, just west of Platform Bridge Road, approximately 1,100 feet north of SFDB. • **Mitigation Site.** An approximately 1.2-acre abandoned floodplain area adjacent to Lagunitas Creek. The site is characterized by disturbed grassland and ruderal (weedy) vegetation formerly used for cattle grazing, and contains abandoned grazing infrastructure (e.g., corrals, feeding troughs) as well as small areas of fill that would need to be removed. The site is generally flat with elevations ranging from approximately 62 – 63 feet NGVD. Soils are mapped as stratified depositions of sand, gravel, cobbles and stones with ephemeral depositions of silt and sandy loam, as is typical of floodplains along the creek ("Fluvents, channelized" under Soil Conservation Service Soil Survey maps). • The proposed mitigation site was selected by MMWD for the following reasons: (1) the site has floodplain topography and substrate conditions suitable for backwater channel creation; (2) the site is currently disturbed and does not support woody riparian	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		habitat or wetlands; and (3) the site is publicly-owned (by the NPS) and is easily accessible to construction equipment due to it proximity to Platform Bridge Road. • **Mitigation Approach.** The proposed plan is intended to be one element of the overall Winter Habitat Enhancement Program, which would include various winter habitat enhancement efforts along Lagunitas Creek from the Shafter Bridge downstream to Olema Creek. The overall goal of the plan is to establish an approximately 1,200-linear foot, 30-foot wide backwater channel that would establish approximately 0.8 acres of suitable over-wintering habitat for coho salmon juveniles and smolts. The channel would have upstream and downstream connections to Lagunitas Creek and would have a bottom elevation that intercepts baseflows during the winter and early spring based on historical flow records in Lagunitas Creek. Channel cross sections would be modeled after existing backwater channel habitat in Lagunitas Creek and in similar coastal streams elsewhere, and would include gentle sideslopes suitable for the establishment of emergent marsh, seasonal wetland and woody riparian vegetation encompassing at least 0.5 acres. A key design element would be to ensure that salmonids are able to swim into and out of the backwater habitat and not become stranded during lower flows. The backwater habitat enhancement design would also include refuge and cover habitat features for salmonids (e.g., woody debris structures and undercut bank sections). • **Funding Status.** The project has received funding only for detailed topographic surveys, site assessment work and construction plan preparation. The project does not have funding for regulatory approval, construction or follow-up monitoring and management. As mitigation for the SFDB project, the DPW proposes to provide the required funding and/or in-kind services for regulatory approval, construction and follow-up monitoring and management to allow the project to be implemented. • **Schedule.** The MMWD would be selecting an engineering	

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		contractor to conduct hydrologic modeling analysis and to prepare the construction plans, as well as to conduct the related, site specific topographic survey and site assessments. Construction plans are scheduled to be completed by July 2011. The PWD would prepare and submit the Mitigation and Monitoring Plan in accordance with Corps of Engineers, Regional Water Quality Control Board and California Department of Fish and Game requirements as part of the wetland/streambed alteration permit applications for the SFDB Rehabilitation project. Implementation of the plan would occur prior to or simultaneous with the commencement of construction work for the SFDB Rehabilitation project. Project construction, including filling of roadside swales shall not start until a suitable wetland mitigation site has been selected and a Wetland Mitigation and Monitoring Plan for the site has been prepared by Marin DPW and approved by the Corps, RWQCB and CDFG. Mitigation construction work under the plan shall be completed in accordance with a timetable agreed to by these three agencies.	
BIO-11: *Continued*	S	BIO-11c: Marin DPW shall minimize temporary disturbances to streambanks to the smallest amount feasible needed to accomplish culvert replacement, bank stabilization and slope repair work. Marin DPW shall restore disturbed areas to pre-disturbance conditions after temporary project activities are complete. Seed mixes for stabilization of disturbed areas shall consist of species native to Marin County. Fertilizers shall not be applied with any seeding or as part of hydroseed mixes.	LTS
BIO-11: *Continued*	S	BIO-11d: Disturbance of stream channels in the project site shall be limited to the minimum necessary to complete proposed drainage improvement activities. Riparian vegetation shall be trimmed (and not removed) where feasible, and where removal is necessary, should be at the minimum necessary to complete work. Stream channels shall be re-vegetated with appropriate riparian vegetation after work activities are completed. All re-vegetation activities shall be approved by CDFG under the Streambed Alteration Agreement process prior to	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		restoration activities being completed.	
BIO-11: *Continued*	S	BIO-11e: A qualified biologist shall be present during any work occurring within wetlands or streams.	LTS
BIO-11: *Continued*	S	BIO-11f: DPW shall implement all water quality protection measures contained in the SWPPP to prevent the direct and indirect release of soil and other construction materials into wetlands and streams.	LTS
BIO-12: Implementation of the proposed project could induce the spread of panic veldt grass and other non-native invasive plants to previously un-infested areas within the project area.	S	BIO-12a: Prior to project implementation, Marin DPW shall remove populations or individuals of invasive plants listed by the California Invasive Plant Council (CalIPC) with ratings of A or B for impacts and invasiveness from areas of the project site where the ground surface would be disturbed and vegetation removed. Removal activities shall be conducted under the supervision of a botanist qualified in the identification of invasive weed species. Invasive weed removal shall be conducted prior to seed set (as determined by monthly spring surveys by a qualified botanist) to minimize the spread of invasive weed seeds in the project site. If it is not possible to remove weeds prior to seed set, measures to minimize the release of invasive weed seeds during weed removal (e.g., manual weed removal into plastic bags) shall be used.	LTS
BIO-12: *Continued*	S	BIO-12b: If hay bale installation is necessary for erosion-control in the project area, only certified weed-free hay bales shall be used.	LTS
BIO-12: *Continued*	S	BIO-12c: Construction equipment, particularly wheels and tracks, shall be cleaned prior to entering the project site to prevent the spread of invasive weeds from areas outside of the project site. Cleaning shall be achieved by rinsing equipment with water or using high-pressure air.	LTS
BIO-12: *Continued*	S	BIO-12d: When re-vegetation of bare soil surfaces is required, Marin DPW shall utilize a native seed mix pre-approved by CDFG and reviewed by CNPS.	LTS
4.4 CULTURAL RESOURCES			
CULT-1: Project implementation may cause an adverse change to a unique archaeological resource, including federally or State-listed resources, pursuant to CEQA.	S	CULT-1a: Prior to project construction, a professional archaeologist shall establish a barrier around recorded cultural resources subject to impact by project activities so that these Environmentally Sensitive Areas (ESAs) can be avoided during construction. The professional	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		archaeologist shall use high visibility temporary construction fencing or a similar durable material (i.e., not construction flagging) to establish the ESAs. For resources in the project area (i.e., the County right-of-way consisting of 30 feet on each side of the roadway centerline), the fencing shall delineate the entire boundary of the resource. For resources partially in or adjacent to the project area, the fencing shall delineate those portions of the resource that extend into, or are adjacent to, the project area. To the greatest extent feasible, no project construction or access by construction crew shall occur in these areas. The project superintendent, crew foreman, environmental compliance officer, or other responsible project official shall review the condition of the fencing and check for unauthorized entry into these areas on a weekly basis. Any deficiencies in the fencing shall be repaired at the direction of the responsible project official.	
CULT-1 *Continued*	S	CULT-1b: If project construction must occur within a protected area (or if Option A requires tree root mass removal in an ESA, see below), a qualified professional archaeologist shall monitor the ground-disturbing component of such construction. The purpose of the monitoring is to identify intact archaeological deposits prior to substantial disturbance by project construction activity. If intact archaeological deposits are identified by archaeological monitoring, the monitor shall be empowered to temporarily halt construction to assess the find. Impacts to the find by project activities shall be avoided. If such avoidance is not feasible, the County shall conduct the necessary study, in consultation with the project archaeologist, to determine if the deposit qualifies as a historical or unique archaeological resource under CEQA. If the deposit *does not* so qualify, project construction may resume with the continuation of archaeological monitoring. If the deposit *does* so qualify, then the County shall develop and implement, in consultation with the project archaeologist, a plan to mitigate the impact. Mitigation may consist of, but is not limited to, systematic recovery and analysis of archaeological deposits; recording the resource;	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		preparation of a report of findings; and accessioning recovered archaeological materials at an appropriate curation facility. Public educational outreach may also be appropriate. If data recovery excavation is the means selected to recover the scientifically consequential information contained in the deposit, a data recovery plan must be prepared, consistent with the requirements of *CEQA Guidelines* Section 15126.4(b)(3)(C). If the deposit is prehistoric in nature, the County shall seek and consider the input of the Federated Indians of Graton Rancheria regarding the proposed treatment prior to implementing the plan. Any reports generated from the evaluation or mitigation shall be submitted to the County and the Northwest Information Center.	
CULT-1 *Continued*	S	CULT-1c: If deposits of prehistoric or historical archaeological materials are encountered during project activities that are not archaeologically monitored, all work within 25 feet of the discovery shall be redirected and a qualified archaeologist contacted to assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. The County shall also be notified. Project personnel shall not collect or move any archaeological materials. Adverse effects to the deposits shall be avoided by project activities or, if the deposits cannot be avoided, they shall be evaluated as described in Mitigation Measure CULT-1b to determine if the deposit qualifies as a historical or archaeological resource under CEQA and handled, documented and treated accordingly. The County shall inform its contractor(s) of the archaeological sensitivity of the project area by including the following directive in contract documents: *If prehistoric or historical archaeological deposits are discovered during project activities, all work within 25 feet of the discovery shall be redirected and a qualified archaeologist contacted to assess the situation, consult with agencies as appropriate and make recommendations regarding the treatment of the discovery. Project personnel shall not collect or move any archaeological materials or*	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		human remains and associated materials. Prehistoric materials can include flaked-stone tools (e.g., projectile points, knives, choppers) or obsidian, chert, basalt, or quartzite toolmaking debris; bone tools; culturally darkened soil (i.e., midden soil often containing heat-affected rock, ash and charcoal, shellfish remains, faunal bones, and cultural materials); and stone milling equipment (e.g., mortars, pestles, handstones). Prehistoric sites often contain human remains. Historical materials can include wood, stone, concrete footings, walls, and other structural remains; and deposits of wood, glass, ceramics, metal, and other refuse. If the archaeological deposits are prehistoric in nature, the archaeologist shall consult with the Federated Indians of Graton Rancheria regarding the treatment of the find, and the feasible recommendations of the Tribe shall be incorporated in the approved plan.	
CULT-1 *Continued*	S	CULT-1d: If feasible, trees shall be removed by grinding each stump to grade and using a chemical application to kill stump growth. If this approach is taken, impacts to archaeological deposits due to Option A would be less than significant. If this approach is not feasible, and if the root mass must be removed, then Mitigation Measures CULT-1b or -1c shall be implemented, as appropriate, depending on whether or not the tree is located within an ESA.	LTS
CULT-2: Project implementation may cause an adverse change to a unique potential historical resource, including federally or State-listed resources and potential local landmarks (Sir Francis Drake Boulevard), pursuant to CEQA.	S	CULT-2a: The loss of historic headwalls can be mitigated by the documentation that will preserve a record of their contribution to the original roadway design.	LTS
CULT-2 *Continued*	S	CULT-2b: The Marin County DPW shall distribute the Pacific Legacy archaeological survey report to the Marin History Museum Library. Information concerning the location of prehistoric archaeological deposits (including maps and written descriptions) shall be removed from these distribution copies. The distribution of the documentation of SFDB and its associated features will serve an interpretive function at the Museum Library by making publicly available information about the historical development of Marin County's historical roads, and the landscape features that once contributed to this history. The Marin County DPW shall retain a copy of the report to provide a record of historical engineering	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		features for future planning efforts, and would reduce the impact on the historic roadway resource to less-than-significant.	
CULT-3: Project implementation may destroy paleontological resources or sites.	S	CULT-3: The County shall inform its contractor(s) of the paleontological sensitivity of the project area by including the following directive in contract documents: *The subsurface of the construction site may be sensitive for paleontological resources. If paleontological resources are encountered during project subsurface construction, all ground-disturbing activities within 25 feet shall be redirected and a qualified paleontologist contacted to assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. Project personnel shall not collect or move any paleontological materials. Paleontological resources include fossil plants and animals, and evidence of past life such as trace fossils and tracks. Ancient marine sediments may contain invertebrate fossils such as snails, clam and oyster shells, sponges, and protozoa; and vertebrate fossils such as fish, whale, and sea lion bones. Vertebrate land mammals may include bones of mammoth, camel, saber tooth cat, horse, and bison. Paleontological resources also include plant imprints, petrified wood, and animal tracks.* Adverse effects to such paleontological resources shall be avoided. If avoidance is not possible, the discovery should be assessed to determine its paleontological significance. If the discovery is not significant, avoidance is not necessary. If the paleontological resources are significant, they will need to be avoided or adverse effects must be mitigated. Upon completion of the assessment, the paleontologist should prepare a report documenting the methods and results, and provide recommendations for the treatment of the paleontological resources discovered. The report should be submitted to the County and the University of California, Museum of Paleontology. The submittal of the report would reduce the potential impact on paleontological resources to less-than-significant.	LTS
CULT-4: The construction of the proposed project may disturb human remains.	S	CULT-4: If human remains are encountered during construction activities, these remains shall be treated in accordance with Health	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		and Safety Code §7050.5. The County shall inform its contractor(s) of the sensitivity of the project area for human remains by including the following directive in contract documents: *If human remains are encountered during project activities, whether archaeologically monitored or not, work within 25 feet of the discovery shall be redirected and the Marin County Coroner notified immediately. At the same time, a professional archaeologist shall be contacted to assess the situation and consult with agencies as appropriate. The County should also be notified. Project personnel shall not collect or move any human remains and associated materials. If the human remains are of Native American origin, the Coroner must notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission will identify a Most Likely Descendant (MLD) to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods.* Upon completion of the assessment, the archaeologist shall prepare a report documenting the methods and results, and provide recommendations for the treatment of the human remains and any associated cultural materials, as appropriate and in coordination with the recommendations of the MLD. The report shall be submitted to the County and the Northwest Information Center.	
4.5 GEOLOGY AND SOILS			
(1) Located within an Alquist-Priolo Earthquake Fault Zone.	LTS	No mitigation is required.	
(2) Mineral Resources	LTS	No mitigation is required.	
(3) Soil Collapse	LTS	No mitigation is required.	
(4) Unique Geologic Features	LTS	No mitigation is required.	
(5) Sedimentation and Erosion	LTS	No mitigation is required.	
GEO-1: The proposed project may be subject to seismic shaking hazard impacts.	S	GEO-1: Prior to the commencement of the project, the Geotechnical Investigation and associated recommendations, as prepared by a licensed professional, shall be submitted to the County of Marin	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		Public Works Engineering Division. The Geotechnical Investigation's determination of the project area's surface geotechnical conditions and potential seismic hazards such as liquefaction, lateral spreading, and landslides shall be considered in the project design. The Geotechnical Investigation's recommendations of construction techniques appropriate to minimize seismic damage shall be adopted as part of the project design and implementation plan. Some of the recommended construction techniques from the project-specific Geotechnical Investigation include: • Full depth replacement of soft subgrade materials, such as un-engineered fill or colluvium, with engineered fill. This would be accomplished by excavation of the subgrade and replacement with select imported fill materials. • Excavations for the removal of culverts should be cleaned of loose materials and widened as necessary to permit compaction equipment access. The excavations should be subsequently backfilled with properly compacted fill. • Imported select fill should be of low expansion potential and free of organic matter, and should conform, in general, to the following requirements: - Plasticity Index less than 15% - Liquid Limit less than 40% - Percent Soil Passing #200 Sieve between 15% and 60% - Maximum Aggregate Size 4 inches • Consultation with a licensed geotechnical engineer to provide the appropriate engineering specifications input for design of any required structures to withstand seismic forces. • Finished project grading and surfaces should avoid any ponding of water or concentrated seepage under structures or adjacent to the roadway.	

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		In addition, the following shall be implemented: • The County of Marin Public Works Engineering Division shall review the Geotechnical Investigation along with final project plans and confirm that the proposed improvements fully comply with the County of Marin Uniform Construction Standards and that the Geotechnical Investigation recommendations have been incorporated. • All design criteria and specifications set forth in the Geotechnical Investigation shall be implemented as a condition of project approval.	
GEO-2: Damage to proposed improvements related to expansive soils, corrosive soils, and/or settlements of non-engineered fill or disparate soils could occur.	S	GEO-2: The designers and engineers of proposed improvements (including roads, pullouts, parking areas, and utilities) shall consider the site's potential to be underlain by soils with moderate to high shrink-swell potential and, per the Geotechnical Investigation's recommendations, a qualified professional shall observe soil conditions in the field during the rehabilitation process. If locations along the alignment of SFDB are underlain by expansive soils and/or non-engineered fill, the geotechnical consultant to the project shall determine if the soils encountered are problematic, and shall make recommendations to ensure potential damage related to expansive soils and non-uniformly compacted fills are minimized. Mitigation options may range from removal of the problematic soils, and replacement, as needed, with properly conditioned and compacted fill, to design and construction of improvements to withstand the forces exerted during the expected shrink-swell cycles and settlements. All design criteria and specifications set forth in the Geotechnical Investigation and as made by the geotechnical consultant while monitoring the project shall be implemented to reduce impacts associated with problematic soils. The Geotechnical Investigation consultant shall include an evaluation of the potential for corrosive soils. If the results indicate corrosive	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		soil conditions, appropriate measures to mitigate these conditions shall be incorporated into the design of project improvements, such as culverts, that may come into contact with site soils. Wherever corrosive soils are found in sufficient concentrations, recommendations shall be made to protect iron, steel, metal, and concrete from long-term deterioration caused by contact with corrosive onsite soils. In general, these recommendations are expected to include, but not be limited to, the following provisions: • Protect buried iron, steel, cast iron, ductile iron, galvanized steel, and dielectric coated steel or iron (including all buried metallic piping) against corrosion from soil. • Protect buried metal and cement structures in contact with earth surfaces from chloride ion concentrations. • Use sulfate-resistant concrete mix for all concrete in contact with the ground. • Consult a corrosion expert as needed during the project's detailed design phase to design the most effective corrosion protection.	
GEO-3: Landslide hazards could result in roadway damage, vehicle damage, and/or injuries.	S	GEO-3: Prior to the commencement of the project, a site-specific design-level geotechnical investigation shall be conducted of the slope instability feature at Station 270+25. The geotechnical investigation shall be prepared by a licensed geotechnical engineer and the geotechnical report shall be submitted to the County of Marin Public Works Engineering Division. The geotechnical investigation shall include documentation of geologic mapping of the site and adjacent areas, exploratory borings, appropriate laboratory testing of soils samples, and recommendations for repair of the slope instability feature. All design criteria and specifications set forth in the design-level geotechnical investigation shall be implemented as a condition of project approval.	LTS
4.6. HYDROLOGY AND WATER QUALITY			
(1) Groundwater	LTS	No mitigation is required.	

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
(2) Runoff	LTS	No mitigation is required.	
(3) Flooding	LTS	No mitigation is required.	
(4) Stormwater	LTS	No mitigation is required.	
(5) Dam Inundation	LTS	No mitigation is required.	
(6) Tsumani or Seiche	LTS	No mitigation is required.	
(7) Ongoing Maintenance Activities	LTS	No mitigation is required.	
HYD-1: Construction period and operation period activities could generate stormwater runoff that could cause or contribute to a violation of water quality standards or waste discharge requirements, or otherwise substantially degrade the water quality of Lagunitas Creek and/or Tomales Bay.	S	HYD-1a: Prior to construction, consistent with the requirements of the Construction General Permit, the County shall prepare a SWPPP designed to reduce potential impacts to surface water quality through the project construction period. The SWPPP shall be prepared by a Qualified SWPPP Developer. The SWPPP shall include, as applicable, all Best Management Practices (BMPs) required in Attachment D for Risk Level 2 dischargers, or Attachment E for Risk Level 3 dischargers (as appropriate based on final determination of the project's Risk Level status). The SWPPP shall include a construction site Monitoring Program that includes requirements for dry weather visual observations of pollutants at all discharge locations, and as appropriate (depending on the Risk Level), sampling of the site effluent or receiving waters (receiving water quality monitoring is only required for some Risk Level 3 dischargers). The County shall also prepare a Rain Event Action Plan as part of the SWPPP. BMP implementation shall be consistent with the BMPs requirements in the California Stormwater Quality Association Stormwater Best Management Handbook-Construction.[5] Following are the types of BMPs that shall be implemented, subject to review and approval by the Water Board. **Erosion Control BMPs**	LTS

[5] California Stormwater Quality Association, 2003a, Stormwater Best Management Handbook-Construction, with updates through 2006. Website: http://www.cabmphandbooks.com/Construction.asp, accessed November 2, 2009.

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		• *Scheduling*. To reduce the potential for erosion and sediment discharge, construction shall be scheduled to minimize ground disturbance during the rainy season. The project applicant shall: o Sequence construction activities to minimize the amount of time that soils remain disturbed. o Stabilize all disturbed soils as soon as possible following the completion of ground disturbing work. o Install erosion and sediment control BMPs prior to the start of any ground-disturbing activities. • *Preservation of Existing Vegetation*. Where feasible, existing vegetation shall be preserved to provide erosion control. • *Stabilize Soils*. Hydroseeding and geotextile fabrics shall be used, as appropriate, to reduce erosion. • *Stabilize Streambanks*. When working along stream banks or within channels, BMPs shall be implemented to minimize channel erosion and sedimentation. Proper erosion and sediment controls, such as silt fences, mulch, geotextiles, and hydroseeding, shall be used. To the extent possible, existing vegetation that stabilizes the stream banks shall be preserved. While working within a stream channel, a barrier to isolate the work area shall be created, divert the stream around the work site, or employ practices to minimize sediment suspension. • *Drainage Swales*. Construct drainage swales to divert runoff away from exposed soils and stabilized areas, and redirect the runoff to a desired location. • *Outlet Protection and Velocity Dissipation Devices*. Install rock or concrete rubble at culvert and pipe outlets to prevent scour of the soil caused by concentrated high-velocity flows. **Sediment Control BMPs**	

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		• *Silt Fence/Fiber Roll*. Silt fences or fiber rolls shall be installed around the perimeter of the areas affected by construction, at the toe of slopes, around storm drain inlets, and at outfall areas, to prevent offsite sedimentation. • *Slope Protection and Vacuuming*. When working adjacent to Lagunitas Creek on steep banks, a barrier shall be erected and equipment capable of vacuuming sediment shall be provided during pavement grinding and excavation operations. • *Storm Drain Inlet Protection*. Storm drains shall be protected using a filter fabric fence, gravel bag barrier, or other methods, to allow sediments to be filtered or settle out before runoff enters drain inlets. • *Sand Bag or Gravel Bag Berm*. Sand or gravel bags shall be installed as a linear erosion or sediment control measure to pond sheet flow runoff and reduce the discharge of sediment. **Wind Erosion Control BMPs** • *Dust Control*. Potable water shall be applied using water trucks to alleviate nuisance caused by dust. Water application rates shall be minimized to prevent erosion and runoff. • *Stockpile Management*. Silt fences shall be used around the perimeter of stockpiles and stockpiles shall be covered with plastic to prevent wind dispersal of sediment. **Tracking Controls** • *Stabilized Construction Entrance/Exit*. Construction site entrances and exits, the equipment yard, the water filling area for water trucks, and the project office location, shall be graded and stabilized to prevent runoff from the site and erosion. • *Tire Wash*. A tire washing facility shall be installed to allow for tire washing when vehicles exit the site to prevent tracking onto	

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		public and private streets. **Non-Stormwater Controls** • *Dewatering.* The SWPPP shall include a dewatering plan for non-contaminated groundwater specifying methods of water collection, transport, treatment, and discharge. The discharger shall consult with the Water Board regarding any required permit (other than the Construction General Permit) or Basin Plan conditions prior to initial dewatering activities to land, storm drains, or waterbodies. Water produced by dewatering shall be impounded in holding tanks or other holding facilities to settle the solids and provide other treatment as necessary prior to discharge to receiving waters. Discharges of water produced by dewatering shall be controlled to prevent erosion. • *Illicit Connection/Discharge Detection and Reporting*. Contractors shall regularly inspect the site for evidence of illicit connections, illegal dumping, or discharges. Such discharges shall immediately be reported to the stormwater illegal discharge contact for Marin County. • *Vehicle and Equipment Cleaning*. Construction equipment shall be washed regularly in a designated enclosed area. Except for concrete washout, vehicle cleaning shall not be performed on site. Concrete washout waste will be contained and managed properly. • *Vehicle and Equipment Fueling and Maintenance*. Self-propelled vehicles shall be fueled off-site or at the temporary fueling area. Fuel trucks equipped with absorbent spill clean-up materials shall be used for all on-site fueling; the fuel truck shall be parked on the paved fueling area for overnight storage. Drip pans shall be used for all mobile fueling. Drip pans or absorbent pads shall be used for all vehicle and equipment maintenance activities. Vehicle maintenance and mobile fueling operations shall be conducted on a level graded area, at least 50 feet away	

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		from operational inlets and drainage facilities. • *Paving and Grinding Operations*. Proper practices shall be implemented to prevent run-on and run-off, and to properly dispose of waste. Paving and grinding activities shall be avoided during the rainy season, when feasible. • *Structure Demolition*. Potable water shall be sprayed during road demolition to control dust. **Waste Management and Materials Pollution Control BMPs** • *Material Delivery, Storage and Use*. The general material storage area shall be located in the contractor's yard. Two watertight shipping containers shall be used to store hand tools, small parts, and most construction materials that can be carried by hand, such as paint cans, solvents and grease. Very large items, such as light standards, framing materials, and stockpiled lumber, shall be stored in the open in the general storage area. Such materials shall be elevated with wood blocks to minimize contact with run-on. Spill clean-up materials, material safety data sheets, a material inventory, and emergency contact numbers shall be maintained at the site. • *Spill Prevention and Control*. Proper procedures shall be implemented to contain and clean-up spills and prevent material discharges into the storm drain system. • *Solid Waste Management*. Solid wastes shall be loaded directly into trucks for off-site disposal. When on-site storage is necessary, solid wastes shall be stored in watertight dumpsters in the general storage area of the contractor's yard. Asphalt concrete and Portland cement concrete rubble shall be removed immediately to an approved disposal site. • *Sanitary/Septic Waste Management.* Portable toilets shall be located and maintained 50 feet away from drain inlets and away	

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		from paved areas. • *Stockpile Management.* Stockpiles shall be surrounded by sediment controls and shall be covered. Alternatively, soil binders may be used to minimize erosion. If contaminated soils are encountered, such as soils containing aerially-deposited lead, stockpiles shall be covered and bermed and located away from storm drain inlets and watercourses, and on-site storage shall be minimized. Hazardous materials shall be transported and disposed in accordance with applicable regulations (refer to Mitigation Measure HAZ-1c). • *Concrete Waste Management.* Cement-based fill material shall be used for the project and waste management shall be consistent with requirements in the CA BMP Handbook (BMP WM-8). Concrete washout waste will be contained and managed properly. • *Training.* Construction site personnel shall receive training on implementing all BMPs included in the SWPPP. All personnel that inspect BMPs and perform other monitoring activities, such as visual observations and collecting water quality samples, shall be trained. • *Post-Construction BMPs*. Outlet protection/energy dissipating devices, vegetative buffer strips, or sand filters shall be installed at culverts and along the roadway. Exposed slopes shall be seeded with a mix native to Marin County that is appropriate for erosion control.	
HYD-1: *continued*	S	HYD-1b: As part of project implementation, the County shall implement the following three water quality improvement measures: 1. The County shall install a permeable layer, as the top surface layer above impervious rubberized asphalt concrete on all paved road sections. Runoff exiting the permeable friction course shall be designed to sheetflow on the underlying impervious asphalt concrete and discharge into the nearest storm drain inlet, culvert,	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		or directly over the outboard edge of the road. 2. Pullout areas shall be designed with permeable asphalt for the to allow stormwater to percolate through the asphalt and be collected in an udnerdrain that will be routed to discharge at the nearest existing roadway culvert. 3. In locations where the road slopes toward Lagunitas Creek and there is adequate space, a vegetative buffer strip shall be established adjacent to the road. The buffer strip vegetation shall be indigenous to Marin County and shall also be suitable for erosion control. The buffer shall be protected from vehicle traffic and illicit parking by placement of a barrier (e.g., guardrail, boulders) between the road and the buffer. 4. In locations where the road slopes toward the hillside and away from Lagunitas Creek, a vegetated swale with permeable backfill underneath that would function like a sand filter shall be installed where feasible. A perforated pipe shall be installed within the permeable backfill to direct infiltrating runoff to the nearest culvert; the underdrain shall reduce the ponding of water that inundates the road during significant storm events. The bioswale vegetation shall be indigenous to Marin County and shall also be suitable for erosion control. Swales/sand filters shall not be installed in locations of freshwater emergent wetlands (to preserve the wetlands).	
4.7 HAZARDS AND HAZARDOUS MATERIALS			
(1) Emission of Hazardous Materials within ¼ mile of an Existing or Proposed School	LTS	No mitigation is required.	
(2) Included on a List of Hazardous Materials Sites	LTS	No mitigation is required.	
(3) Within the Vicinity of a Public or Private Airstrip	LTS	No mitigation is required.	
(4) Emergency Response or Evacuation Plan	LTS	No mitigation is required.	
(5) Wildland Fires	LTS	No mitigation is required.	
HAZ-1: Project construction activities would entail the use of	S	HAZ-1a: Prior to the initiation of project construction, a soil	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
hazardous materials and could also encounter hazardous materials in shallow soils, which would require transportation off site and disposal. In addition, hazardous materials used or encountered during construction could create a significant hazard through release into the environment.		investigation shall be performed by a licensed professional to evaluate if ADL and other potentially hazardous constituents are present in shallow soils that would be disturbed. Chemical analyses for soil shall be performed by an analytical laboratory certified by the California Department of Public Health Environmental Laboratory Accreditation Program. A licensed professional shall review the results of the soil investigation and provide recommendations on additional investigation activities, if any, and soil management requirements during project construction, if applicable (see Mitigation Measure HAZ-1c). The analytical results of the soil investigation shall be compared to hazardous waste criteria and health and safety thresholds for construction workers. The soil investigation shall be conducted with oversight from a local or state regulatory agency.	
HAZ-1 *Continued*	S	HAZ-1b: Prior to the initiation of project construction, a project-specific HASP shall be prepared by a certified industrial hygienist that shall include measures to protect construction workers and the general public, if contaminants are identified during the soil sampling recommended in Mitigation Measure HAZ-1a. Such measures shall include monitoring, engineering controls, administrative controls, and security measures to prevent unauthorized entry into the construction area. If prescribed exposure levels for contaminants (see Mitigation Measure HAZ-1a) are exceeded, personal protective equipment shall be required for workers in accordance with state and federal regulations. The HASP shall address the possibility of encountering unknown contamination or subsurface hazards, in addition to emergency response procedures in the event of a hazardous materials release. The project sponsor shall verify that the HASP is incorporated into the construction worker's health and safety programs.	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
HAZ-1 *Continued*	S	HAZ-1c: If warranted, based on the results of the pre-construction soil characterization (Mitigation Measure HAZ-1a), the County shall implement a Risk Management Plan (RMP) that will identify special soil management and disposal procedures and/or construction worker health and safety procedures (in addition to the HASP) to be implemented during project construction to reduce exposure to hazardous materials. The RMP shall include all necessary procedures to ensure that excavated soils are stored, tested, managed, and disposed of in a manner that is protective of human health and in accordance with applicable laws and regulations. The County shall ensure that the RMP includes available data from any pre-project construction soil sampling activities (Mitigation Measure HAZ-1a). The County shall provide the RMP to construction contractors and ensure that contractors are following the RMP. The RMP shall consider the following requirements: • Excavation, transportation, and placement operations shall result in no visible dust. • A construction "Exclusion Zone" shall be identified where hazardous materials may be stored. A temporary security fence shall be installed to surround and secure the exclusion zone. • Air quality shall be monitored during excavation of soils contaminated with hazardous constituents. • Storage of hazardous materials shall comply with the requirements in Title 22, CCR, Sections 6626.250 to 66265.260. • If temporary stockpiling of hazardous materials is necessary, the construction contractor shall: − Cover the stockpile with plastic sheeting or tarps. − Install a berm around the stockpile to prevent runoff from leaving the area. − Locate the stockpile away from storm drain inlets and	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		Lagunitas Creek. • Hazardous materials shall be excavated, transported, and disposed in accordance with the rules and regulations of the following agencies: – United States Department of Transportation (DOT). – United States Environmental Protection Agency (EPA). – California Environmental Protection Agency (Cal/EPA). – California Division of Occupational Safety and Health (DOSH). – Local regulatory agencies.	
HAZ-1: *Continued*	S	HAZ-1d: The Storm Water Pollution Prevention Plan required as Mitigation Measure HYD-1a shall include Best Management Practices (BMPs) for containing hazardous materials and minimizing the contact of hazardous materials (e.g., fuels, lubricants, paints, solvents, and adhesives) with rain and stormwater runoff, including BMPs for stockpile management.	LTS
4.8 TRAFFIC AND CIRCULATION			
(1) Cause a Substantial Increase in Traffic	LTS	No mitigation is required.	
(2) Exceed Roadway LOS Standard	LTS	No mitigation is required.	
(3) Result in a Change in Air Traffic Patterns	LTS	No mitigation is required.	
(4) Result in Inadequate Parking Capacity	LTS	No mitigation is required.	
(5) Intersection LOS	LTS	No mitigation is required.	
(6) Parking and Internal Circulation	LTS	No mitigation is required.	
(7) Pedestrian and Bicycle Circulation	LTS	No mitigation is required.	
(8) Generation of More than 100 PM Weekday Peak Hour Trips	LTS	No mitigation is required.	

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
TR-1: Project constrution activities could increase roadway hazards during the construction period due to the temporary closure of one travel lane, the presence of construction vehicles, and pavement damage created by construction traffic.	S	TR-1: For the proposed project or Option A, prior to construction, the project contractor shall submit a Traffic Management Plan (TMP) to Marin County DPW for review and approval. During construction activities, the Marin County DPW and the project contractors working on the project shall adhere to all requirements of the TMP. Implementation of a TMP would reduce potential impacts to a level of less than significant. The TMP shall include the following: • The route selection for movement of heavy equipment and truck traffic in the project vicinity shall be coordinated with the Marin County DPW, Marin County Sheriff's Department, and Police Department for applicable cities and unincorporated communities (Lagunitas, Forest Knolls, Woodacre, Olema, Point Reyes Station, Nicasio, San Anselmo, San Rafael, and Fairfax), State Parks, and Golden Gate National Recreation Area to minimize traffic and physical road impacts. Truck drivers shall be notified of and required to use the most direct route between the project site and US 101. • Heavy equipment transport, material transportation, or exportation to and from the project site shall not occur during weekday commute peak traffic periods and shall be coordinated by the contractor with the Marin County DPW, Marin County Sheriff's Department, and relevant city police departments. • Construction activities shall be coordinated with State Parks, Golden Gate National Recreation, affected cities and communities, and affected property owners to minimize disruption to local traffic. • Construction worker parking, material storage, and construction staging areas to the extent possible shall be specified and located within the boundaries of the project site in coordination with State Parks personnel. • Warning signs indicating frequent truck entry and exit shall be posted at the main construction points. Flaggers shall monitor and control ingress and egress of large construction vehicles to	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		and from the site as well as lane closures. • Debris and mud on nearby streets caused by trucks shall be monitored daily, and a roadway cleaning program shall be instituted as necessary. • Westbound construction truck trips shall be prohibited on weekdays between the hours of 7:00 a.m. and 9:00 a.m. Eastbound construction truck trips shall be prohibited on weekdays between 4:00 p.m. and 6:00 p.m.	
TR-2: Construction of the project could result in inadequate emergency access.	S	TR-2: A schedule of construction activities and the Traffic Management Plan (TMP) prepared per Mitigation Measure TR-1 shall be provided to any pertinent local emergency service providers, including the Marin County Fire Department, Marin County Sheriff's Department, City of Fairfax Fire and Police Departments, Town of San Anselmo and City of San Rafael Fire and Police Departments, and paramedics	LTS
TR-3: Construction of the project could affect transit service through the project area during the construction period.	S	TR-3: Prior to the start of the construction activities, Marin Transit shall be provided with detailed information regarding construction delays to plan a route deviation and/or notify passengers.	LTS
4.9 AIR QUALITY			
(1) Clean Air Plan (CAP) Consistency	LTS	No mitigation is required.	
(2) Odor Emissions	LTS	No mitigation is required.	
(3) Operational Emissions	LTS	No mitigation is required.	
AIR-1: Demolition and construction period activities could generate significant dust, exhaust and organic emissions.	S	AIR-1: Consistent with guidance from the BAAQMD, the following actions shall be required of construction contracts and specifications for the project. *Demolition.* The following controls shall be implemented during demolition: • Water during demolition of structures and break-up of pavement to control dust generation; • Cover all trucks hauling demolition debris from the site; and	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		• Use dust-proof chutes to load debris into trucks whenever feasible. *Construction.* The following controls shall be implemented at all construction sites: • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered as necessary to minimize the generation of dust. • 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 mph. • All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. • Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.) • Replant vegetation in disturbed areas as quickly as possible. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacture's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.	

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		• Post a publicly visible sign with the telephone number and person to contact at the County of Marin regarding dust complaints. This person shall respond and take corrective action within 48 hours. The phone number of the BAAQMD shall also be visible to ensure complaints with applicable regulations.	
4.10 NOISE			
(1) Vibration Impacts	LTS	No mitigation is required.	
(2) Aircraft Noise	LTS	No mitigation is required.	
(3) Operational Period Impacts	LTS	No mitigation is required.	
NOI-1: Construction period activities could create significant short-term noise impacts on noise sensitive receptors in the project area.	S	NOI-1a: During all construction, the project contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards. During construction, the County shall monitor noise levels to ensure they remain below 95 dBA measured 50 feet from the noise source.	LTS
NOI-1 *Continued*	S	NOI-1b: The project contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the active project site.	LTS
NOI-1 *Continued*	S	NOI-1c: The construction contractor shall locate equipment staging in areas that will create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the active project site during all project construction.	LTS
NOI-1 *Continued*	S	NOI-1d: The construction contractor shall ensure that all general construction related activities are restricted to Monday through Friday between the hours of 7:00 a.m. and 6:00 p.m. Construction activities shall not be conducted on Saturdays, Sundays and holidays.	LTS
NOI-1 *Continued*	S	NOI-1e: The Marin County DPW shall post an information sign at entrances to the construction zones easily visible to the public. The signs shall identify the permitted construction hours and the name, telephone number, and other pertinent contact information and list of responsibilities for the entity responsible for overall construction and noise management. The information signs shall also provide a means for members of the public to receive information about project construction. The County DPW shall record all noise complaints	LTS

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
		received and actions taken in response. Informational signs shall be posted for the duration of project construction.	
NOI-1 *Continued*	S	NOI-1f: The project manager shall be responsible for responding to any local complaints about construction noise. The project manager will determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will determine and implement reasonable measures warranted to correct the problem.	LTS
4.11 PUBLIC SERVICES AND UTILTIES			
(1) Fire Protection	LTS	No mitigation is required.	
(2) Police Protection	LTS	No mitigation is required.	
(3) Schools	LTS	No mitigation is required.	
(4) Parks and Recreation	LTS	No mitigation is required.	
(5) Water Supply	LTS	No mitigation is required.	
(6) Solid Waste	LTS	No mitigation is required.	
PS-1: Construction of the proposed project would generate waste water and human waste that if not disposed of at the proper facilities, could pose a public health impact.	S	PS-1a: In accordance with Mitigation Measure HYD-1, portable restroom and washroom facilities shall be located 50 feet away from drain inlets to prevent accidental release of wastewater materials into these areas. A qualified biologist shall be consulted on location of such facilities prior to their placement.	LTS
PS-1: *Continued*	S	PS-1b: Portable restroom and washroom facilities shall have secondary containment placed around them in order to contain wastewater materials in the event that a leak or accidental release should occur.	LTS
PS-1: *Continued*	S	PS-1c: Portable restroom and wastewater facilities shall be monitored, maintained, and emptied on a regular basis to ensure that the facilities continue to function properly.	LTS
4.12 GLOBAL CLIMATE CHANGE			
(1) Long-Term GHG Emissions	LTS	No mitigation is required.	
(2) Consistency with Plans and Policies related to Greenhouse Gases	LTS	No mitigation is required.	

Environmental Impacts	Level of Significance Without Mitigation	Mitigation Measures	Level of Significance With Mitigation
GCC-1: Construction of the proposed project could generate substantial GHG emissions.	S	GCC-1: Consistent with draft guidance from the BAAQMD, the following best management practices shall be required of construction contracts and specifications for the project. • Alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet, as feasible; • Local building materials (within 100 miles) of at least 10 percent; and • Recycle at least 50 percent of construction waste or demolition materials.	LTS

CHAPTER 3.0
PROJECT DESCRIPTION

This chapter describes the proposed Sir Francis Drake Boulevard Rehabilitation Project (proposed project) that is evaluated in this Environmental Impact Report (EIR). A description of the project background, objectives, location, and site characteristics is provided in this chapter followed by details of the project and a summary of required approvals and entitlements.

3.1 PROJECT BACKGROUND

Sir Francis Drake Boulevard (SFDB) is an east-west arterial roadway located in Marin County that commences just west of the Richmond-San Rafael Bridge and ends at the Point Reyes Lighthouse (Figure 3.1-1). A section of SFDB located about one mile west of the Town of Lagunitas between Shafter Bridge and Platform Bridge Road contains segments of deteriorated pavement that has exceeded its design life. The Marin County Public Works Department (Marin County DPW) has completed studies to develop a strategy for the rehabilitation of this 5.2-mile long segment of roadway.

The majority of the roadway displays evidence of distress including cracking and dislocations of the pavement. Prior maintenance by Marin County DPW has included removal and replacement of damaged sections of roadway and overlays of asphalt concrete. However, these repairs are no longer effective as the pavement's structural section has failed. Without major rehabilitation, the roadway's condition will likely further deteriorate as cracks in the pavement allow water to infiltrate, thus weakening the subgrade and creating additional distress.

3.2 PROJECT OBJECTIVES

The County has identified the following objectives for the proposed rehabilitation of SFDB between Shafter Bridge and Platform Bridge Road:

- Restore the roadway pavement to provide an additional 30-year design life.
- Improve the roadway alignment, where possible, to enhance safety.
- Protect environmental resources to the greatest extent possible during and after construction.
- Enhance pedestrian and bicycle use of the roadway.

3.3 EXISTING CONDITIONS

The following section describes the location of the project site, surrounding land uses, and site characteristics.

3.3.1 Location

The project site is located in west central Marin County, approximately 2.84 miles southeast of Point Reyes Station, and 0.58 miles west of Lagunitas, California, respectively. The City of San Rafael is located approximately 9.82 miles west of the project site (see Figures 3.1-1 and 3.3-1). The project site comprises a section of the SFDB roadway located in an unincorporated area of Marin County between Shafter Bridge and SFDB's intersection with Platform Bridge Road. For reference to specific project site features, a station line, as shown in Figure 3.3-2, is provided along the roadway. Each station indicates an interval of 100 feet beginning with Station 5+~~60~~ 80 at Platform Bridge Road and ending with Station ~~279~~273+50 at Shafter Bridge.

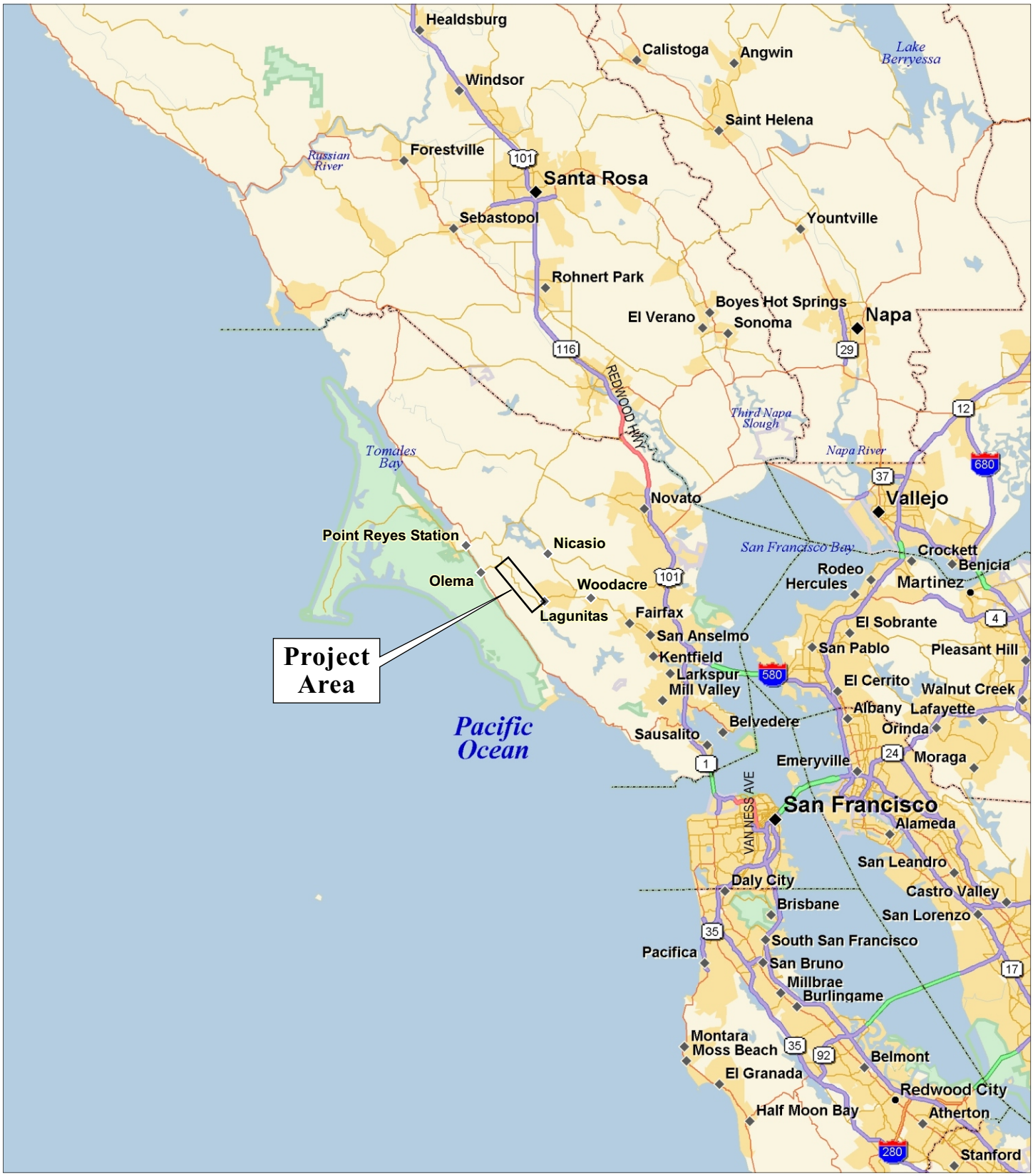
3.3.2 Surrounding Land Uses

Surrounding land uses consist primarily of parklands and associated recreational activities. Lands adjacent to the affected roadway are owned by the State of California and the federal government, and are administered as a state park (Samuel P. Taylor State Park) and a federal recreational area (Golden Gate National Recreation Area). A working ranch (the McIsaac Ranch) is located at the western end of the project site along the north side of SFDB, and is used for cattle ranching. A small number of residences are found along this stretch of SFDB, and are located on State park property. These residences are used as housing for State park employees, are leased out for private use, or are idle and not in current use. Camping facilities are located within Samuel P. Taylor State Park.

3.3.3 Site Characteristics

The project area varies in elevation. Some areas adjacent to SFDB are relatively flat, but the majority of the surrounding area consists of mountainous terrain with steep slopes and incised stream channels. The flatter terrain is located adjacent to the western one-third of the project site. The roadway alignment of SFDB winds along Lagunitas Creek for its entire length. A number of named and unnamed stream courses cross the project area. Properties adjacent to the affected roadway are either heavily wooded or vegetated with annual grassland and scrub habitats. The areas adjacent to the affected roadway are vegetated with the following plant communities:

- Seasonal Wetland
- Stream/Riparian
- Annual Grassland
- Oak Woodland
- Coastal scrub
- Mixed Evergreen Forest
- Redwood Forest
- Ruderal/Disturbed



LSA

FIGURE 3.1-1

Sir Francis Drake Roadway Improvements Project

Project Vicinity

N

0 10

MILES

SOURCE: ©2006 DeLORME. STREET ATLAS USA®2006.

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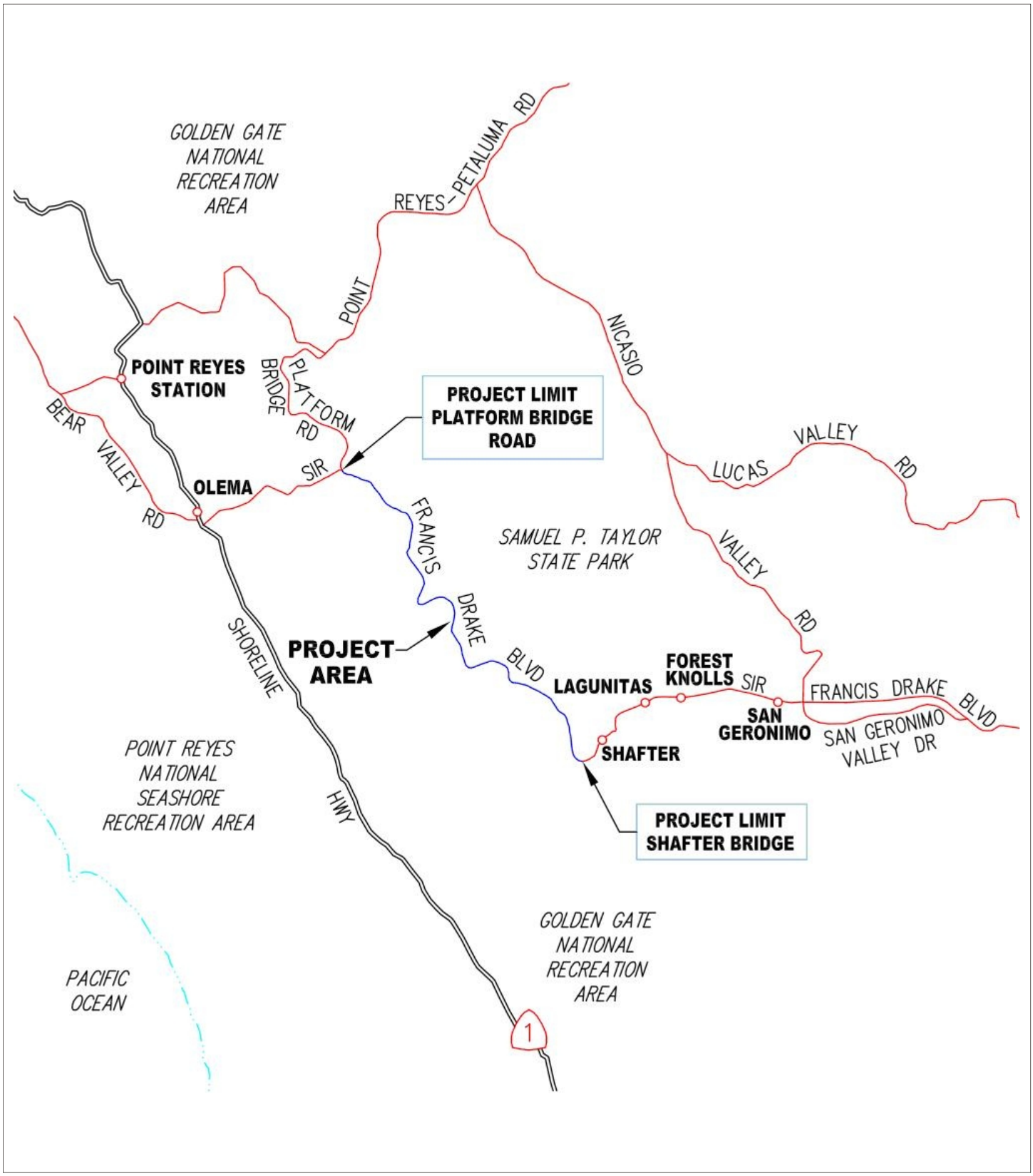

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FIGURE 3.3-1

Sir Francis Drake Roadway Improvements Project

Project Location

N

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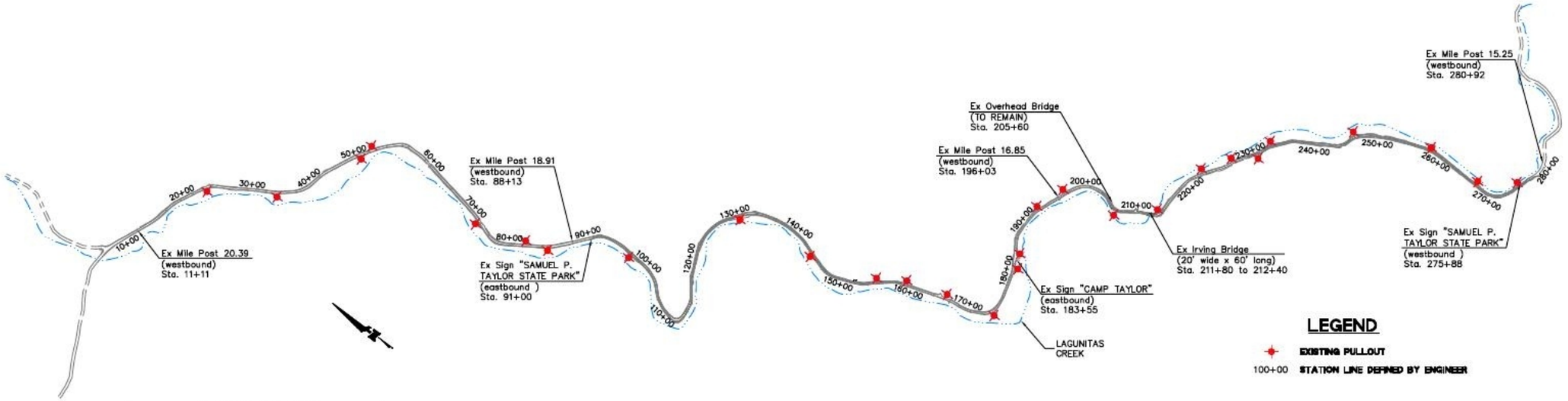
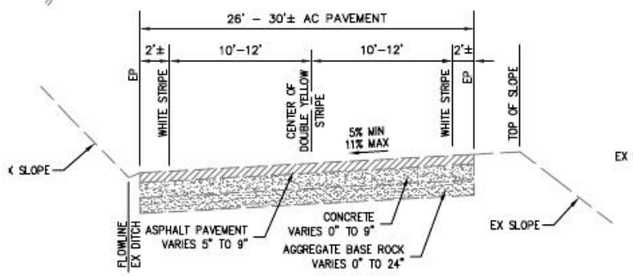
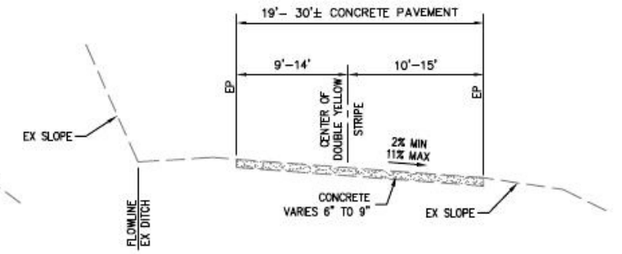




EXISTING SECTION
(FROM PLATFORM BRIDGE ROAD TO STA. 91+00)



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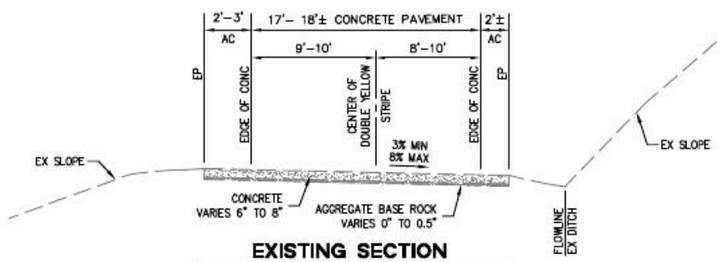
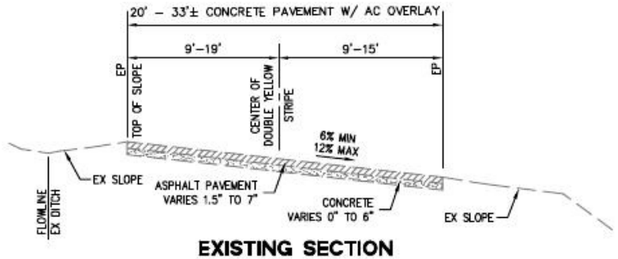


EXISTING SECTION
(FROM STA. 214+30 TO STA. 230+00)



EXISTING SECTION
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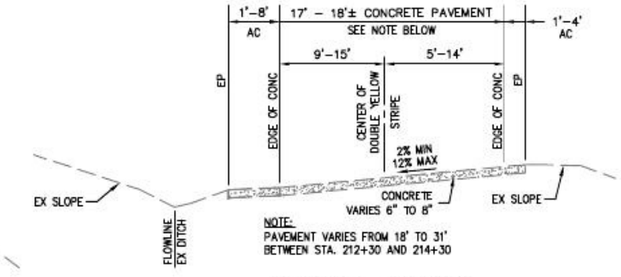

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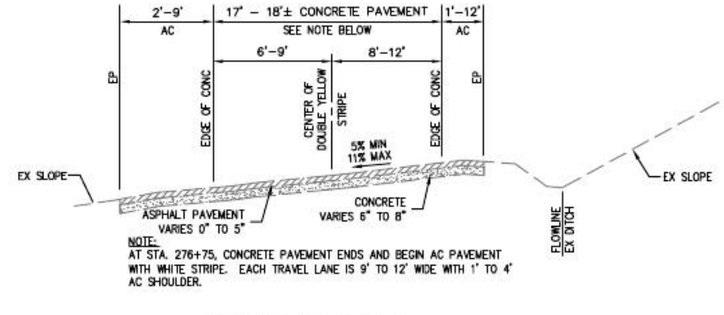

EXISTING SECTION
(FROM STA. 230+00 TO SHAFTER BRIDGE)

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FIGURE 3.3-2

Sir Francis Drake Roadway Improvements Project

Existing Site Conditions

NOT TO SCALE

SOURCE: BKF ENGINEERS, 2010

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Back of Figure 3.3-2

3.3.4 Roadway Conditions

The section of SFDB between Platform Bridge Road and Shafter Bridge was constructed in 1929 as a two-lane arterial roadway. While SFDB bisects both a federal and State park, the County of Marin has historically maintained the roadway. Marin County's ROW is about 60 feet wide and centered approximately on the existing roadway's centerline.

The winding, horizontal alignment of SFDB generally runs parallel to Lagunitas Creek. In response to the numerous tight radius curves along the roadway, the posted speed limit varies from 15 miles per hour (MPH) to 40 MPH. The vertical grades along the roadway range from 0.1 percent to 3.5 percent, with elevations along the centerline of the roadway varying between 82 and 209 feet based on the National Geodetic Vertical Datum of 1988. In sections, the existing roadway is bordered by sloped banks in excess of 45 degrees. The roadway width is constrained by trees, vegetation, and topographic features that are often only a few feet from the existing edge of pavement, as illustrated in the photographs below:

The roadway's width is highly variable. It is narrowest at Shafter Bridge and widest at Platform Bridge Road. West of Shafter Bridge, the roadway is generally between 22 and 30 feet wide with a lane width of 11 feet, but as narrow as 9 feet. Approaching Platform Bridge Road, the roadway is 32 feet wide with a lane width of 12 feet. The sections in Figure 3.3-2 illustrate the various roadway widths contained within the project area.

SFDB does not comply with current design standards as published by the State of California Department of Transportation (Caltrans) or the American Association of State Highway Officials (AASHTO). Items in variance of the standards include:

- Curve radii that are below minimum values
- Alignments containing reverse horizontal curves
- Alignments containing improved transitions between horizontal curves
- Lane width that is too narrow
- Super elevation transitions zones that are too short
- Improper clear recovery zone

- Sight distance and obstacles

3.3.5 Roadway Drainage

The SFDB roadway is superelevated[6] in many areas and as a result runoff is generally directed to one side of the roadway or the other. When the roadway slopes away from the adjacent hillside, storm water sheet flows from the edge of pavement to Lagunitas Creek. When the roadway slopes towards the hillside, storm water flows to the edge of pavement at the toe of slope. Water collects in these areas until it reaches an elevation that allows it to flow to an existing culvert, which then conveys it under the roadway for discharge to Lagunitas Creek. As the profile of SFDB is generally flat and ditches are not well defined, storm water does not pass under the roadway and often inundates a portion of the travel lane during significant storm events. Sixty-eight (68) corrugated metal, reinforced concrete, or plastic pipe culverts and four large concrete box culverts carry storm water beneath SFDB. Locations of these culverts are shown in Figure 3.3-3. According to Marin County DPW maintenance staff and site observations, many of the metal culverts have corroded and require replacement.

3.3.6 Roadway Pavement Condition

The roadway through the project area is primarily constructed of concrete pavement that varies from 6 to 9 inches in thickness. In the narrowest sections, asphalt concrete has been used to widen the concrete pavement in order to provide additional shoulder area. During prior maintenance efforts, up to 8 inches of asphalt concrete was used to overlay the concrete pavement. Additionally, it appears that some sections of the concrete pavement were removed and replaced with traditional asphalt concrete. The asphalt section varies in thickness from 1.5 to 9 inches with an underlying aggregate base varying from 0 to 24 inches.[7]

Soils beneath the roadbed are described as silty sandy gravel, greenstone, and clayey gravel with sand. The Geotechnical Investigation found groundwater at a depth of 2 feet below ground surface (bgs) at the boring nearest Shafter Bridge, at the south end of the project area. Groundwater may be found as shallow as 5 feet bgs, depending on seasonal rainfall, temperature, groundwater withdrawals, and nearby construction activities. The primary subsurface geotechnical issues potentially affecting the roadway condition include variable subgrade conditions, slope instability, and the potential for liquefaction and related ground deformations during seismic events.[8]

A visual evaluation of roadway pavement within the project area concluded that the pavement's condition deteriorates in an easterly direction from Platform Bridge Road. Figure 3.3-4 illustrates examples of pavement distress. The primary distress includes longitudinal and transverse cracks in the concrete pavement as well as a condition known as a shattered slab. A shattered slab occurs when the pavement is broken into four or more sections. Where asphalt has been used to overlay the concrete, cracking is also observed in the asphalt.

[6] Superelevated means that there is a rise in the roadway surface elevation as one moves from the inside to the outside edge of the road. For example, a superelevation rate of 10 percent means that the roadway surface elevation increases by 1 foot for each 10 feet of roadway width.

[7] Kleinfelder, Inc., 2008. Geotechnical Investigation Sir Francis Drake Boulevard Pavement Rehabilitation, Marin County, California. Job No: 82400 (SRO8R038), 21 August.

[8] Kleinfelder, Inc., 2008.

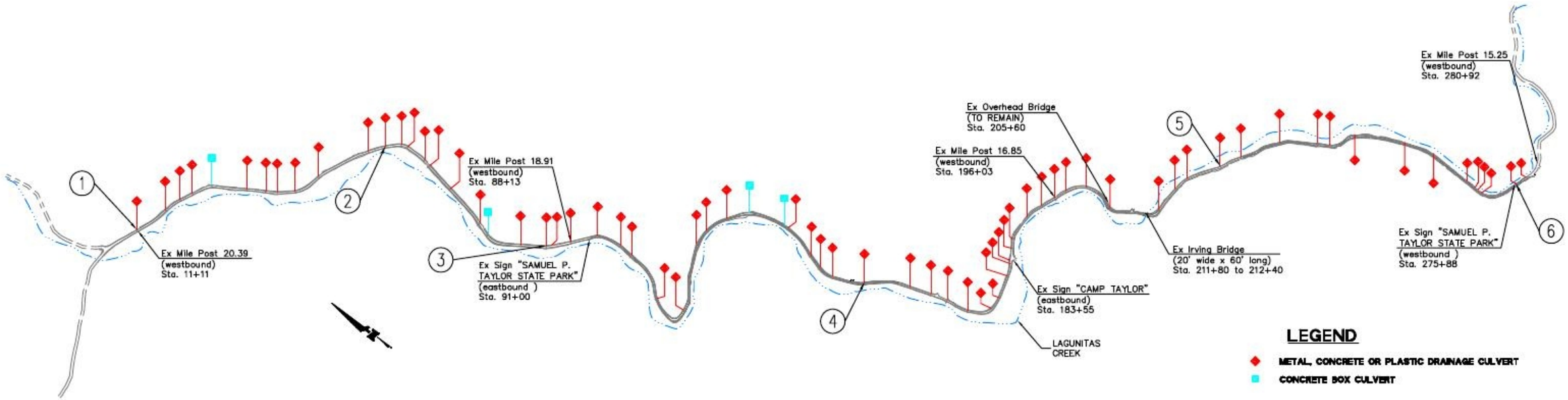

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FIGURE 3.3-3

Sir Francis Drake Roadway Improvements Project

Existing Drainage Structures

NOT TO SCALE

SOURCE: BKF ENGINEERS, 2010

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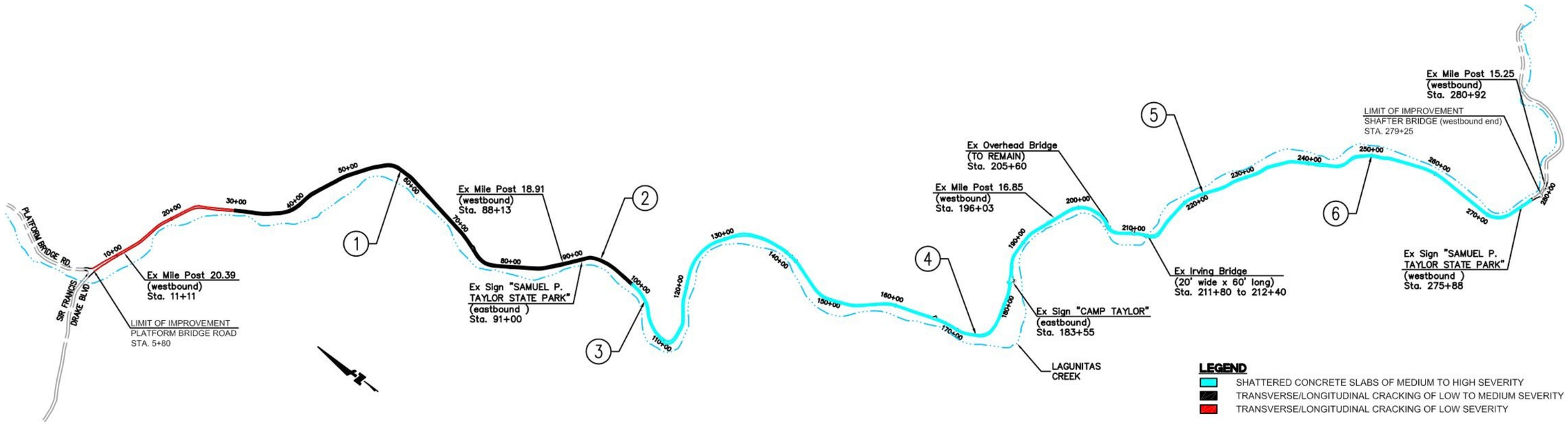
Back of Figure 3.3-3



1 DISLOCATED SLAB

2 SHOULDER ALLIGATOR CRACKING

3 SHATTERED CONCRETE SLAB

4 SHATTERED CONCRETE SLAB

5 SHATTERED CONCRETE SLAB

6 SHATTERED CONCRETE SLAB

LSA

FIGURE 3.3-4

Sir Francis Drake Roadway Improvements Project

Pavement Conditions

NOT TO SCALE

SOURCE: BKF ENGINEERS, 2010

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Back of Figure 3.3-4

The project site has three distinct pavement conditions that include:

- **Segment 1: Station 100+00 to Shafter Bridge.** Segment 1 is primarily composed of concrete pavement with shattered slabs of medium to high severity. The pavement is considered to have failed and has exceeded its design life.
- **Segment 2: Station 30+00 to Station 100+00.** Segment 2 is composed of concrete pavement with a thick layer of asphalt overlay. The primary distress is low to medium severity longitudinal/transverse cracking. This segment has received remedial repairs to extend its design life, but rehabilitation will soon be required to prevent a failed condition.
- **Segment 3: Platform Bridge Road to Station 30+00.** Segment 3 is primarily composed of asphalt pavement over aggregate base. The primary distress is low severity longitudinal/transverse cracking. This segment is currently in relatively good condition.

The three types of distressed segments require different approaches to pavement rehabilitation (see Section 3.4).

In certain locations along SFDB, the edge of the pavement is fractured allowing asphalt binder and aggregate to be dislodged. Storm water washes these roadway materials into the receiving watershed. An additional consequence of the distress along SFDB is an increase in road noise. The noise of a vehicle originates from tire/pavement interaction, engine/powertrain and aerodynamics. Noise associated with the tire and pavement interaction is the dominant source for vehicles traveling above 30 MPH. Observations along SFDB indicate that road noise appears to increase in sections with higher levels of distress as the vehicle's tires encounter dislocations in the pavement.

3.4 PROPOSED PROJECT

The following sections provide an overview of the proposed project including the pavement rehabilitation process, other roadway and drainage improvements, and construction phasing.

3.4.1 Project Components

The following roadway improvements are proposed as part of the project.

Pavement Rehabilitation. Proposed pavement rehabilitation includes the creation of a stable base layer (base course) over which two layers of asphalt would be applied. Two approaches to creating the stable base course are being proposed depending on the condition of the existing pavement as described in Section 3.3.6.

The base course in Segment 1 from Station 100+00 to the Shafter Bridge would be created using a crack and seat technique that would crush the existing concrete roadway material in place. The method would commence by milling all existing asphalt overlay from the concrete pavement. Equipment would then be used to apply loads to the existing concrete pavement at one to three foot intervals to break it into smaller panels. After the cracking is complete, a roller would be used to compress and interlock the panels into the subgrade. This rehabilitation method would prolong the roadway's design life and have the benefit of reducing the number of truck trips as compared with a more traditional method of removing and replacing the base course. The crushed material would be

re-used in the new base course rather than trucking it off site for disposal.

Typical crack and seat operation

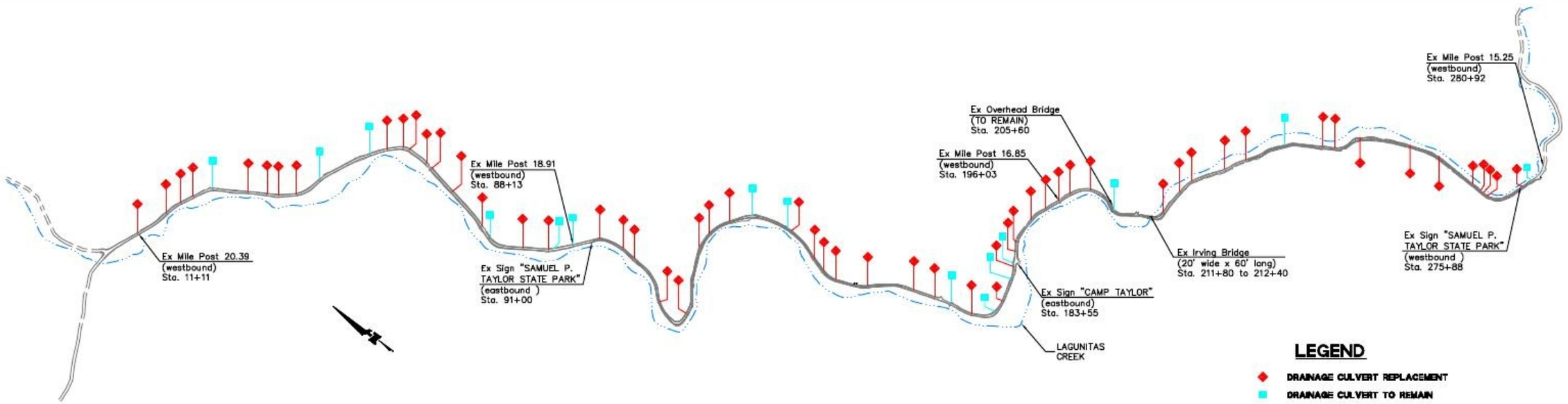
In Segments 2 and 3 from Platform Bridge Road to Station 100+00, where the distress is less severe than Segment 1, a milling method would be used to create the base course. As the distress found in Segments 2 and 3 is localized, only full depth repairs at the distressed locations is required. The process would begin by milling all asphalt overlay from the concrete pavement. The surface of the concrete pavement would then be ground to remove areas with vertical displacements. In segments where the existing pavement is asphalt, concrete pavement would be ground to a depth that leaves a structural section of at least 1.5 inches. All localized failures would be removed and replaced with aggregate base.

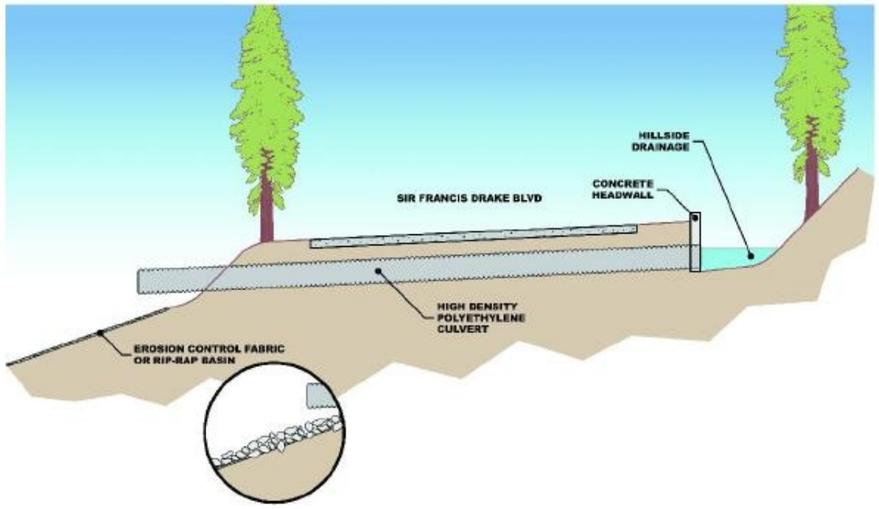
Once the base course is created by either method, two layers of asphalt concrete would be applied to the base course. The first layer would be rubberized asphalt concrete (RAC). RAC is a road material made of recycled tires that has been successfully used in California since the late 1970s. It provides a longer design life than conventional asphalt. The second, upper layer would be a permeable friction course, which is a layer of porous asphalt that has the following benefits:

- **Water Quality:** Studies indicate decreases in total suspended solids and other pollutants discharged from permeable asphalt.
- **Safe:** Reduces spray in wet weather conditions improving visibility and provides excellent traction, reducing the potential for hydroplaning.
- **Quiet:** Research by state highway departments indicates that roads paved with RAC reduce vehicle noise.

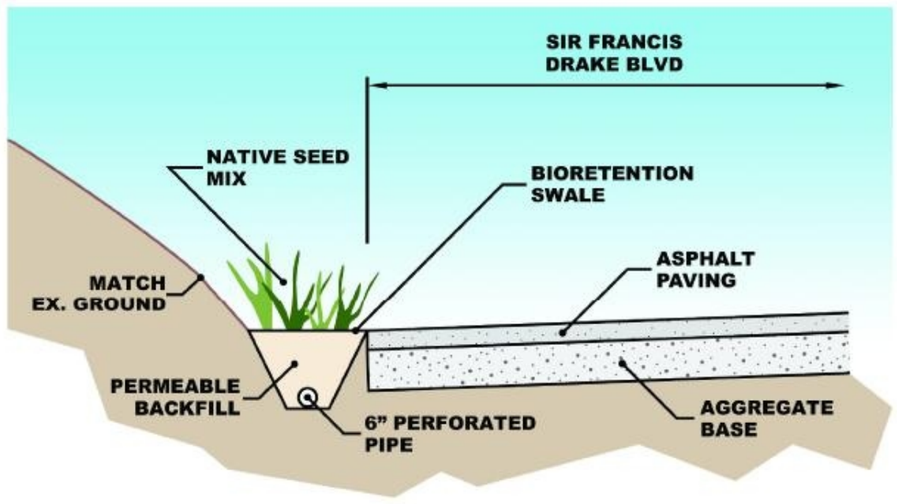
Drainage Improvements. A majority of the existing culverts that are composed of corrugated metal and concrete located within the project site would be removed and replaced (see Figure 3.3-3). Replacement culverts would generally be placed in the same alignment and grade as the existing culvert structures. For existing culverts that extend ten or more feet beyond the proposed edge of pavement, only the section within the project disturbance area would be replaced. When existing headwalls at the culvert's inlet are degraded or nonexistent, new concrete headwalls would be installed.

In locations where erosion is present at the culvert's discharge point, the slope would be reconstructed. Reinforcing fabric would be installed and vegetation would be planted to reinforce the slope. In certain locations where erosion is present and a culvert discharges outside of the banks of Lagunitas Creek, rip rap would be provided. Figure 3.4-1 illustrates the condition.





PROPOSED NEW CULVERT



PROPOSED SWALE SECTION

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FIGURE 3.4-1

Sir Francis Drake Roadway Improvements Project

Proposed Drainage Improvements

NOT TO SCALE

SOURCE: BKF ENGINEERS, 2010

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Back of Figure 3.4-1

To reduce the inundation of the traveled lanes in locations where the roadway slopes to the existing bank, a subdrain would be installed. As shown in Figure 3.4-1, a layer of pervious material would allow runoff from the roadway to percolate and be collected into a perforated pipe. The pipe would be connected to the nearest culvert. To reduce the discharge rate from the pipe, a weir or orifice structure might be installed. These swale areas would require maintenance by the County of Marin. The maintenance would consist of clearing the swale of any materials that could prevent proper percolation as well as intermittent replacement of the previous material layer. The maintenance should be performed in a manner that protects the underlying pipe.

Roadway Pullouts. There are numerous unpaved areas along SFDB that are used by vehicles to pull off the roadway as shown in Figure 3.4-2. Many of the pullouts are too small to safely accommodate a vehicle. Furthermore, some provide inadequate sight distance to vehicles traveling along the roadway creating a hazardous condition. To provide a refuge for slower traveling vehicles, new paved pullouts in appropriate locations and of adequate size and configuration would be provided as shown in Figure 3.4-2. Each pullout to remain would be signed as a no parking zone. To discourage parking and vehicles pulling off the roadway, boulders or large rocks would be placed at the locations of existing pullouts designated for removal.

To limit sediment discharged from the pullout into the watershed during rainfall, the Marin DPW proposes to pave the pullouts to remain with permeable asphalt. Storm water falling on the pullout would percolate through the asphalt, a permeable base, and be collected in a perforated pipe for discharge to the nearest culvert. To reduce the discharge rate from the pipe, a weir or orifice structure might be installed. The parking area at Devil's Gulch is proposed to remain in its current condition as an unimproved surface.

Slope Repair. There is an existing unstable slope condition near station number 270+25 as illustrated in Figure 3.4-3. At this location, the existing roadway was constructed across a broad, east-facing colluvial drainage, which likely required the placement of fill along the outside edge of the roadway. Flow from one of the channels within the colluvial drainage is currently collected and conveyed within a culvert that discharges directly onto the downward slope supporting the roadway. As no energy dissipation structures are present at the outfall, the concentrated flows have resulted in localized erosion. In addition, at some locations sheet flow from the existing roadway is discharged directly onto the down-slope. Approximately 200 linear feet of the edge of roadway and shoulder appear to have settled, as much as two feet in some locations. Over the years the Marin County DPW maintenance staff has placed numerous overlays of asphalt at this location, but report that the condition has worsened over the last few years.

The unstable slope is likely the result of improper placement of fill when the roadway was constructed resulting in settlement and/or lateral movement over time. Additionally, as the slope erodes, it steepens, creating an unstable gradient. As the distress is located next to the edge of the roadway, the slope failure is likely shallow.

To repair the roadway, a pier-supported cantilevered tie-back concrete retaining wall at the roadway's edge is proposed as shown in Figure 3.4-3. The wall would retain the roadway's subgrade and be anchored in firm materials. The existing culvert would be routed down slope where an appropriate energy dissipation device would be installed. The concrete mixture would be tinted and textured to

provide a darker, natural looking structure. Visual simulations of the proposed slope repair are provided in Figure 3.4-4.

Slope repair would require the removal of up to eight trees located adjacent to the roadway. Trees to be removed are shown in Table 3.4.A.

Table 3.4.A: Tree Removal for Slope Repair

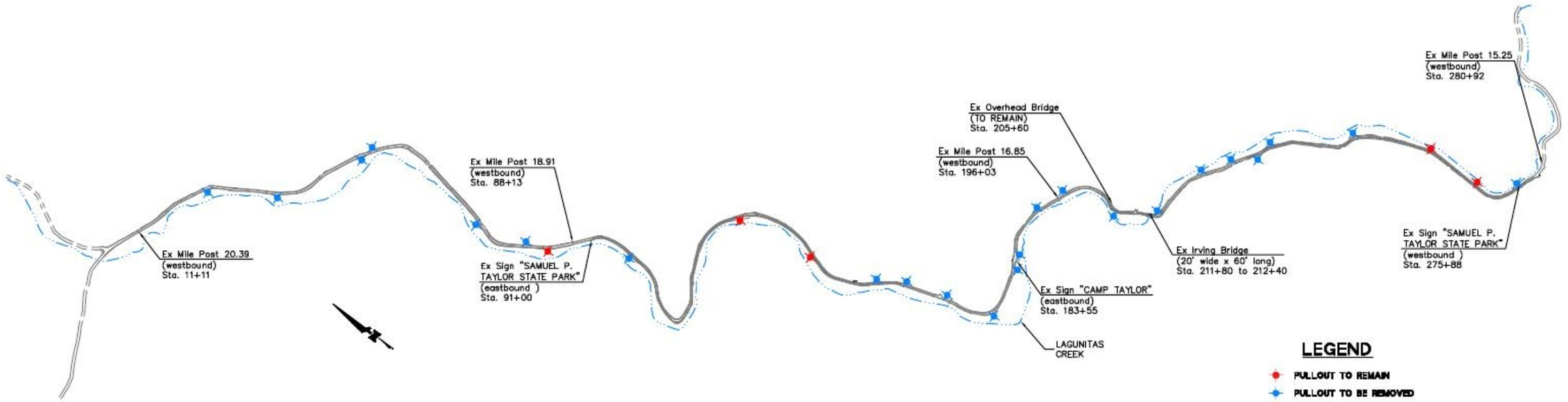
Number	Tree Tag Number[9]	Type/Diameter	Diameter	Estimated Height
1	33	California Bay	16 inches	50 feet
2	32	Coast Redwood	32 inches	60 feet
3	(no tag)	Coast Redwood	8 inches	20 feet
4	(no tag)	California Bay	12 inches	20 feet
5	(no tag)	California Bay	12 inches	15 feet
6	31	Coast Redwood	12 inches	28 feet
7	(no tag)	California Bay	19 inches/19 inches	50 feet
8	30	California Bay	28 inches	50 feet

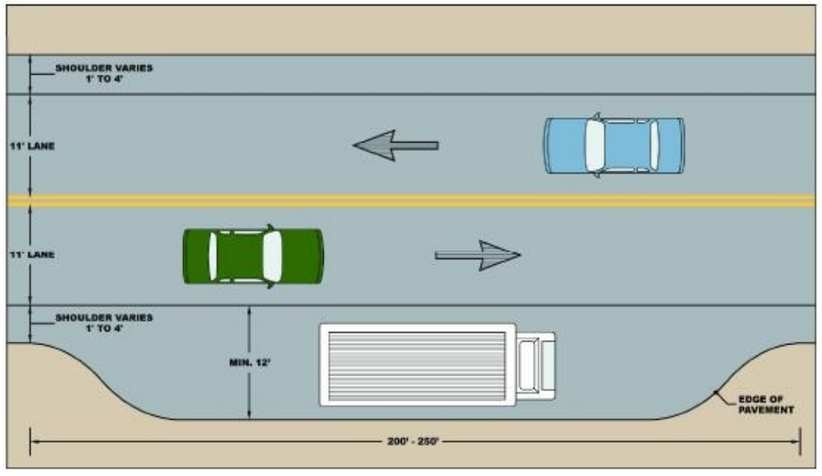
Other Proposed Roadway Improvements. In addition to the pavement rehabilitation, drainage improvements, and formalizing selected pullouts, improvements to the existing roadway's alignment and width are proposed. Where possible, modifications to the horizontal alignment would be made to ensure compliance with Caltrans design guidelines and AASHTO. The proposed project improvements are shown in Figure 3.4-5 and summarized in Table 3.4.B. These improvements maintain much of the construction within the existing roadway limits and do not require tree removal or major excavations. To provide for additional shoulder width and to minimize the expansion of the roadway's grading limit, low retaining walls of no more than 3 feet in height might be provided. Figure 3.4-6 shows the limits of the retaining walls, totaling approximately 2,000 linear feet over the entire 5.2 mile project alignment. The retaining walls would be constructed from prefabricated, tinted concrete providing a wood-like appearance as shown in Figure 3.4-7. Drain rock would be placed behind the walls to allow for the hillside runoff to move freely to the base of the wall. The walls would be manufactured with weep holes spaced properly to drain subsurface water.

Table 3.4.B: Proposed Roadway Dimensions

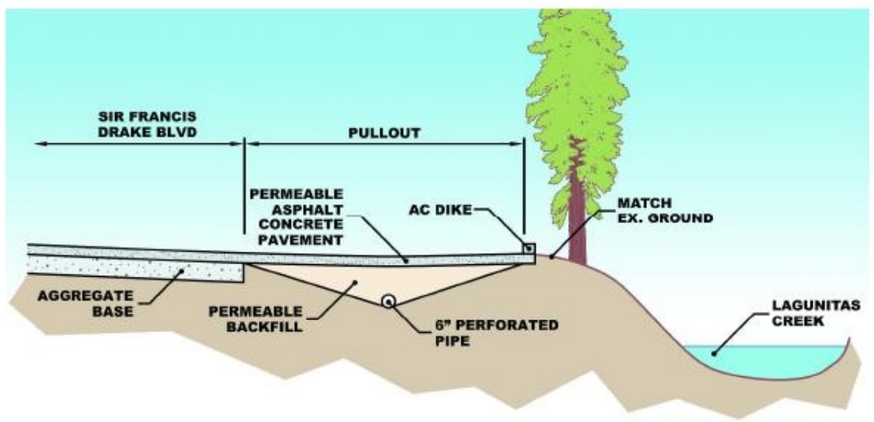
Station Range	Overall Width (ft)	Lane Width (ft)	Shoulder Width (ft)
5+80 to 15+50	30	11	4
15+50 to 19+00	28	11	3
19+00 to 35+00	26	11	2
35+00 to 43+00	28	11	3
43+00 to 60+00	30	11	4
60+00 to 73+00	26	11	2
73+00 to 77+50	28	11	3
77+50 to 112+00	26	11	2
112+00 to ~~116~~115+00	30	11	4
~~116~~115+00 to 137+00	28	11	3
137+00 to 140+00	24	11	1
140+00 to 142+50	28	11	3
142+50 to 150+00	26	11	2
150+00 to 160+00	28	11	3
160+00 to 168+50	26	11	2

[9] Tree tags from Arborists Tree Survey (Horticultural Associates 2008).





TYPICAL PULLOUT



TYPICAL PULLOUT SECTION

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FIGURE 3.4-2

Sir Francis Drake Roadway Improvements Project

Proposed Pullout Improvements

NOT TO SCALE

SOURCE: BKF ENGINEERS, 2010

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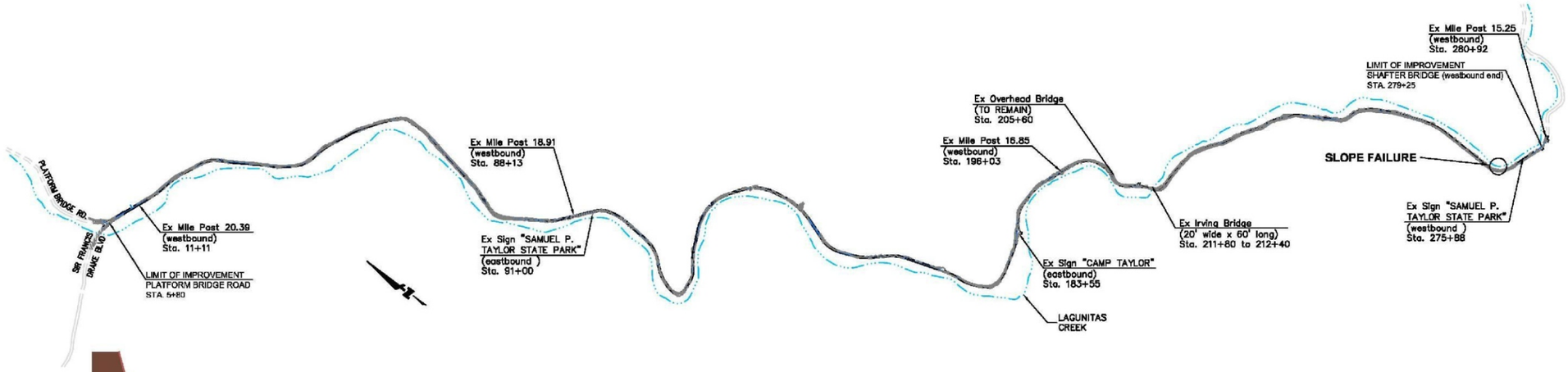
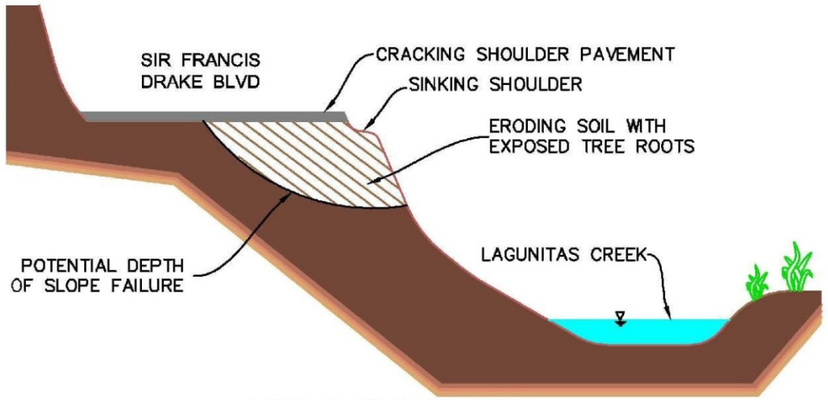
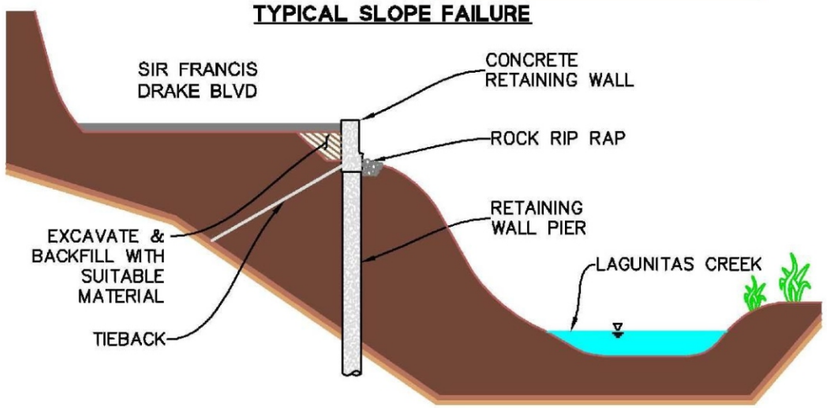
Back of Figure 3.4-2





TYPICAL SLOPE FAILURE



SLOPE REHABILITATION

PHOTO 1: SLOPE FAILURE

PHOTO 2: EDGE OF PAVEMENT

EXISTING FAILURE CONDITIONS

LSA

FIGURE 3.4-3

Sir Francis Drake Roadway Improvements Project

Proposed Slope Repair

NOT TO SCALE

SOURCE: BKF ENGINEERS, 2010

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Back of Figure 3.4-3

Conceptual visual simulation of proposed slope repair as viewed from Lagunitas Creek

Conceptual visual simulation of retaining wall for slope repair as viewed from Sir Francis Drake Boulevard

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FIGURE 3.4-4

Sir Francis Drake Roadway Improvements Project

Visual Simulations of Slope Repair

SOURCE: BKF ENGINEERS, 2010

Back of Figure 3.4-4

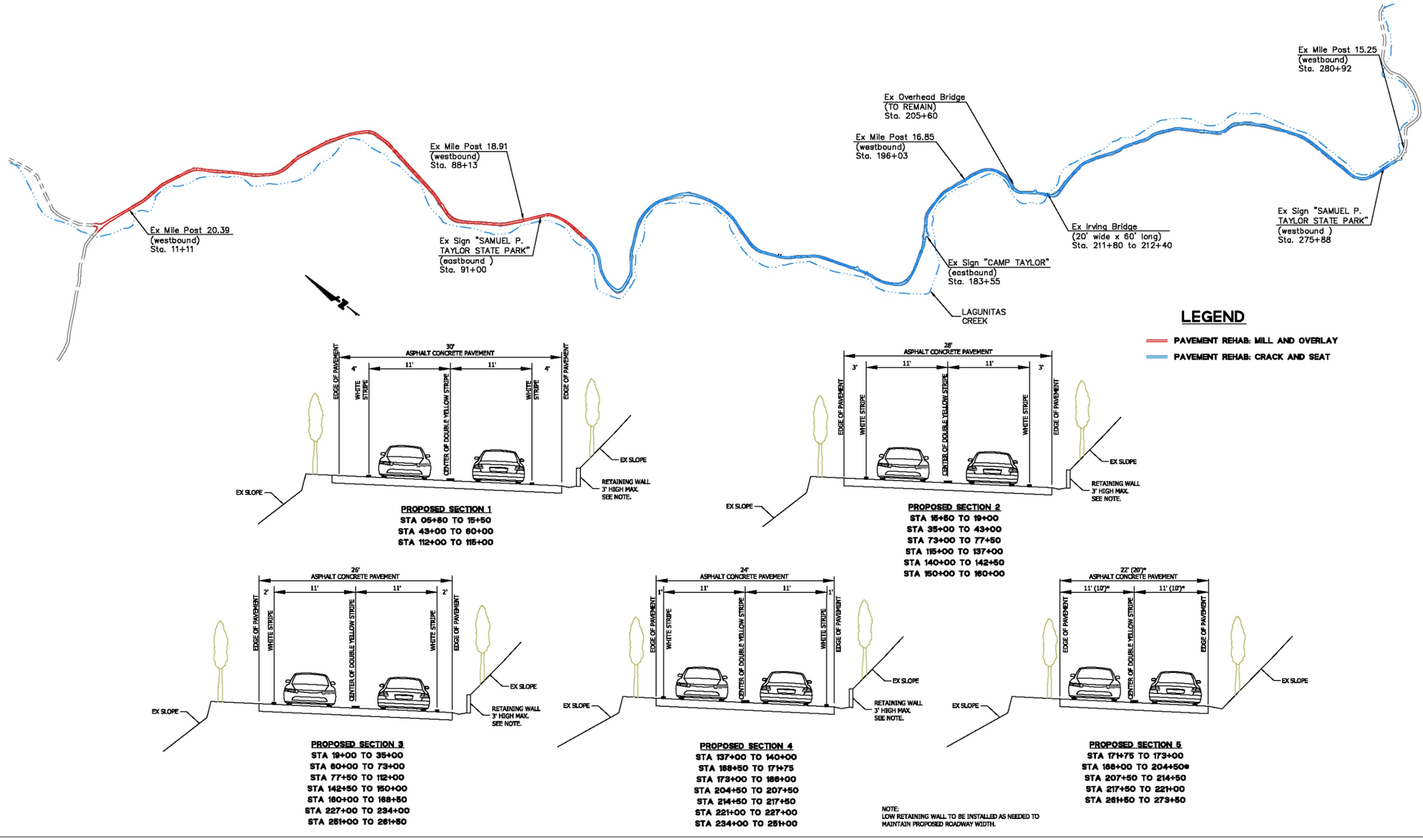

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FIGURE 3.4-5

Sir Francis Drake Roadway Improvements Project

Additional Project Improvements

NOT TO SCALE

SOURCE: BKF ENGINEERS, 2010

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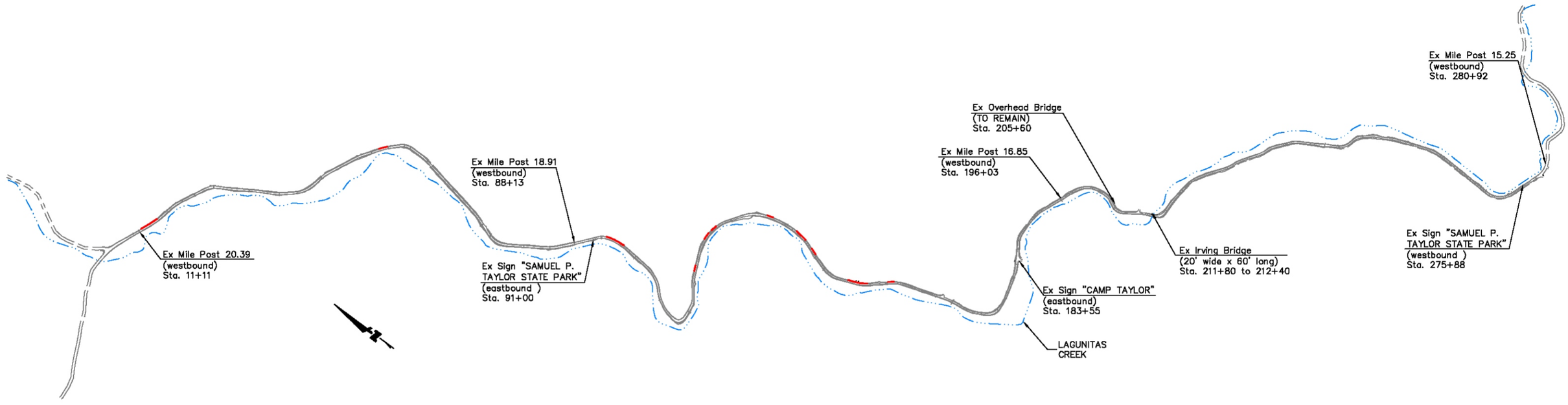
Back of Figure 3.4-5



LIMITS OF RETAINING WALL

STA 11+50 TO STA 14+50
STA 51+50 TO STA 52+90
STA 93+00 TO STA 96+00
STA 119+20 TO STA 120+20
STA 124+30 TO STA 125+50
STA 126+00 TOSTA 127+00
STA 135+00 TO STA 136+00
STA 140+00 TO STA 142+00
STA 143+50 TO STA 144+70
STA 151+25 TO STA 154+50
STA 157+50 TO STA 158+50

LSA

FIGURE 3.4-6

Sir Francis Drake Roadway Improvements Project

Proposed Retaining Wall Improvements

NOT TO SCALE

SOURCE: BKF ENGINEERS, 2010

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Back of Figure 3.4-6

Conceptual visual simulation of tinted concrete retaining wall

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FIGURE 3.4-7

Sir Francis Drake Roadway Improvements Project

Visual Simulation of Low Retaining Wall

SOURCE: BKF ENGINEERS, 2010

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Back of Figure 3.4-7

Table 3.4.B continued

Station Range	Overall Width (ft)	Lane Width (ft)	Shoulder Width (ft)
168+50 to 171+75	24	11	1
171+75 to 173+00	22	11	-
173+00 to 186+00	24	11	1
186+00 to 204+50	20	10	-
204+50 to 207+50	24	11	1
207+50 to 214+50	22	11	-
214+50 to 217+50	24	11	1
217+50 to 221+00	22	11	-
221+00 to 227+00	24	11	1
227+00 to 234+00	26	11	2
234+00 to 251+00	24	11	1
251+00 to 261+50	26	11	2
261+50 to 273+50	22	11	-

Option A - Proposed Roadway Improvements. Option A roadway improvements would provide additional shoulder area, a more uniform roadway width, and increased sight distance. Under Option A the roadway would be widened as shown in Table 3.4.B. Roadway widening would require the removal of up to nine trees located adjacent to the roadway. If the nine trees detailed in Table 3.4-3 are removed, an additional 2,400 linear feet of shoulder could be provided. Figure 3.4-8 illustrates the Option A improvements (roadway sections) and related tree removal.

Table 3.4.C: Proposed Option A Dimensions

Station Range	Overall Width (ft)	Lane Width (ft)	Shoulder Width (ft)
5+80 to 15+50	30	11	4
15+50 to ~~18~~19+00	28	11	3
~~18~~19+00 to 35+00	26	11	2
35+00 to 43+00	28	11	3
43+00 to 60+00	30	11	4
60+00 to 73+00	26	11	2
73+00 to 77+50	28	11	3
77+50 to 112+00	26	11	2
112+00 to 115+00	30	11	4
115+00 to 137+00	28	11	3
137+00 to 140+00	24	11	1
140+00 to 142+50	28	11	3
142+50 to 150+00	26	11	2
150+00 to 160+00	28	11	3
160+00 to ~~166~~168+50	26	11	2
~~166~~168+50 to 171+75	24	11	1
171+75 to 173+00	22	11	-
173+00 to 188+00	24	11	1
188+00 to 193+00	22	11	-
193+00 to 207+50	24	11	1
207+50 to 212+00	22	11	-
212+00 to 217+50	24	11	1
217+50 to 221+00	22	11	-
221+00 to 227+00	24	11	1
227+00 to 234+00	26	11	2
234+00 to 251+00	24	11	1
251+00 to 261+50	26	11	2
261+50 to 273+50	22	11	-

Approximately 2,000 linear feet of low retaining walls would be needed for both the proposed project and Option A. Figure 3.4-6 shows the limits of the necessary retaining walls. Additional shoulder width cannot be achieved in other locations along SFDB due to critical topographic constraints. Any further increase in roadway width would create the need to fill portions of Lagunitas Creek and to cut into the existing slopes. As the slopes are very steep, the volume of earthwork would be extensive. Furthermore, this would create the need to remove more existing trees as they would be in conflict with the grading limits.

Table 3.4.D: Tree Removal Under Option A

Number	Station	Side of Road[10]	Tree Tag Number[11]	Type/Diameter	Diameter	Estimated Height
1	70+00	Left	580	Coast Live Oak	25 inches/20 inches	35 feet
2	159+25	Right	1099	Coast Redwood	77 inches	80 feet
3	186+15	Right	1228	Coast Redwood	55 inches	90 feet
4	187+05	Right	1231	Coast Redwood	60 inches/ 60 inches	90 feet
5	193+05	Left	422	Coast Redwood	24 inches	70 feet
6	193+20	Left	425	Coast Redwood	40 inches	80 feet
7	204+40	Right	1315	Coast Redwood	50 inches	80 feet
8	210+60	Right	366	Coast Redwood	78 inches	120 feet
9	277+00	Left	3	Coast Redwood	95 inches	120 feet

Construction Equipment to be Used During Construction. The following construction equipment would be utilized to rehabilitate SFDB:

Table 3.4.E: Construction Equipment to be Used

Equipment Type	Number Used
Asphalt Milling Machine	1
Concrete Breaker/ Rubilizer	1
Concrete Saw	1
Smooth Drum Compactor	1
Soil Compactor	1
Front End Loader	1
Back Hoe Loader	2
Track Excavator	1
Asphalt Paver	2
Asphalt Roller	3
Portable Crushing Plant	1
Trucks to haul spoils from site	4
Asphalt Truck	4
Water Truck	2
Miscellaneous support vehicles	6

Basic Best Management Practices to be Implemented During Construction. The following best

[10] Side of road traveling west toward Point Reyes Station
[11] Tree tags from Arborists Tree Survey (Horticultural Associates 2008).

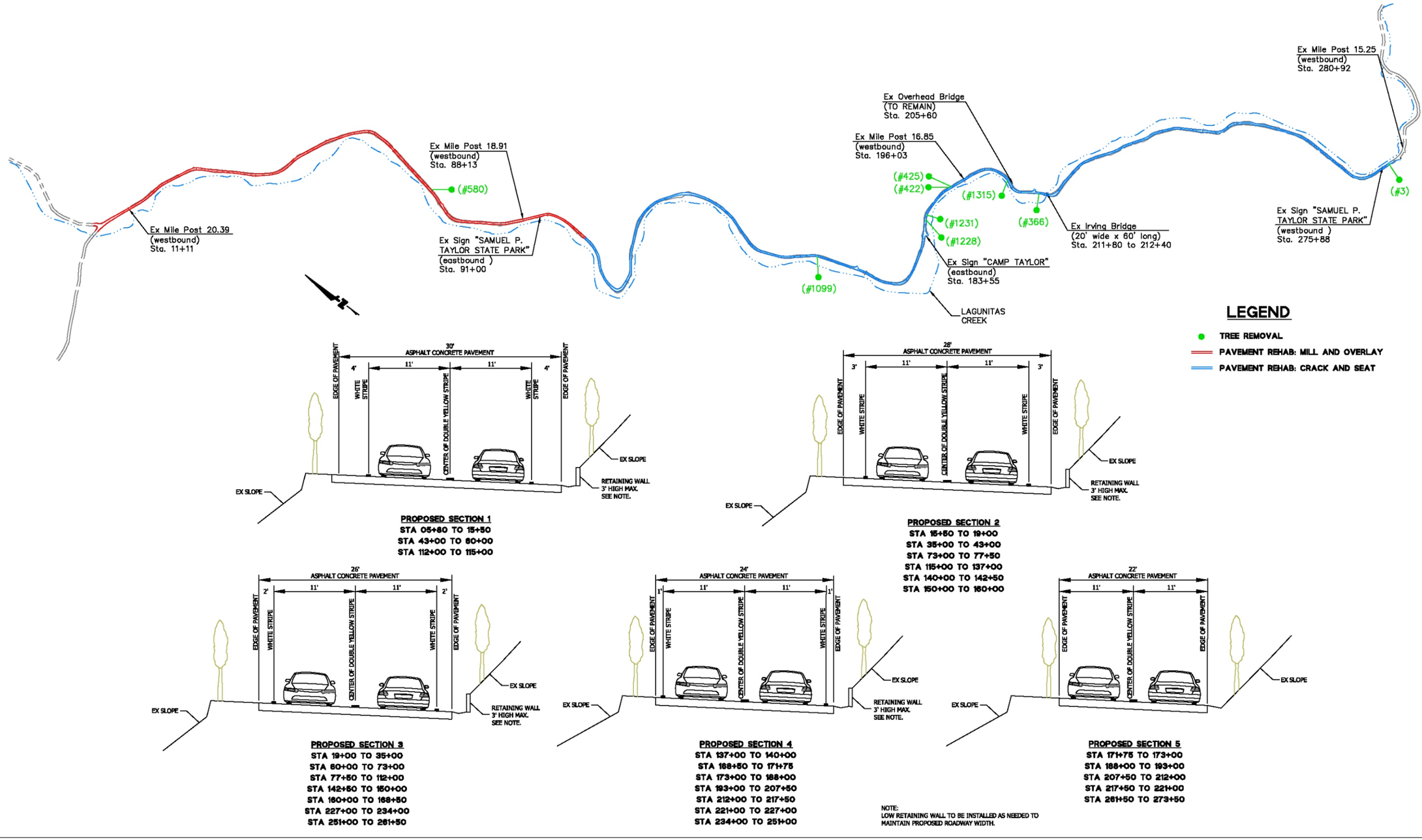

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FIGURE 3.4-8

Sir Francis Drake Roadway Improvements Project

Option A Improvements

NOT TO SCALE

SOURCE: BKF ENGINEERS, 2010

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Back of Figure 3.4-8

management practices would be implemented during construction activities:

- The contractor shall be required to stockpile all building materials in a single location far from creeks or tributaries. All stockpiles shall be covered to prevent erosion. Erosion control devices shall be installed to prevent the transport of sediment. During excavation, water shall be applied to reduce dust. All pavement located in the work zone shall be regularly swept. During saw cutting, all debris shall be vacuumed immediately.
- At the completion of construction, all disturbed areas shall be hydro seeded with a native seed mix.
- All construction equipment shall be required to have industry standard muffling devices. Work creating excessive noise shall be coordinated to limit noise impacts.
- All construction equipment shall be regularly inspected for leaks. In addition, all refueling and maintenance shall be conducted at one location where spill protection can be provided.
- When working adjacent to existing trees, excavation shall be completed by hand methods. An arborist shall be present to inspect this work in order to minimize the risk of injury to the trees.

3.4.2 Construction Phasing and Schedule

To facilitate the construction activities of the proposed project, one lane of traffic would be closed during working hours. As there is no practical detour around the work zone, one-way traffic, controlled by flagging personnel, would be allowed to pass. Access to driveways in the work zone would be provided during construction. However, access to driveways may be restricted during paving operations for as long as four hours. Notice will be given in advance of the time access will be restricted. The staging necessary to complete the project would include the following:

- **Stage 1:** Saw cut along centerline of the roadway to separate concrete slab from the west and eastbound lanes.
- **Stage 2:** Grind asphalt from the existing concrete slab.
- **Stage 3:** Remove and replace culverts along SFDB. Place temporary asphalt paving. Remove and replace localized pavement failures. Repair slope at approximate Station 270+00.
- **Stage 4:** Begin work in a westerly direction from Shafter Bridge with the pavement cracking, compacting, or grinding operation. Place a single lift of asphalt concrete pavement prior to the end of each workday to allow for two-way traffic. During the workday, use the eastbound lane for controlled two-way traffic. Tree removal, retaining wall construction, and bioswale development to be completed on the north side of SFDB as needed.
- **Stage 5:** Begin working in an easterly direction from Platform Bridge Road with the pavement cracking, compacting, or grinding operation. Place a single lift of asphalt concrete pavement prior to end of each workday to allow for two-way traffic. During the workday, use the westbound lane for controlled two way traffic. Tree removal, retaining wall construction, and bioswale development to be completed on south side of SFDB as needed.
- **Stage 6:** Apply the final asphalt lift working in a westerly direction from Shafter Bridge. During the workday, use the east bound lane for controlled two-way traffic.

- **Stage 7:** Apply the final asphalt lift working in an easterly direction from Platform Bridge Road. During the workday, use the west bound lane for controlled two-way traffic.
- **Stage 8:** Apply the final signing and striping to the roadway.

It is expected that the project would require approximately 200 working days, or 9 months, to complete construction activities. Construction would need to commence during dry weather as the early stages require excavation into native soils. Native soils exposed to rain can make construction extremely difficult. Construction would need to be complete prior to cold temperatures as asphalt concrete cannot be placed in atmospheric temperatures below 50 degrees Fahrenheit. Thus, the preferred start of construction would be in May, and construction completion would occur by October.

3.5 REQUIRED PERMITS AND APPROVALS

The project would require local, state, and federal permits and approvals prior to construction. These are described below.

3.5.1 Approvals Required by the Lead Agency (County of Marin)

The proposed project requires the Certification of the EIR by the Marin County Board of Supervisors ("the Board"). The Board will vote on whether to certify the EIR before considering the merits of the project and making a decision to approve, approve with conditions, or deny the project or a project alternative. The County will follow its normal notification and hearing processes for Board action. The Board will hold hearings on the EIR and the project merits. After certifying the EIR, the Board will make the final decision about whether to approve, conditionally approve, or deny the project.

3.5.2 Approvals Required from other Agencies

Carrying out the project may require approvals from the following agencies. These agencies could use this EIR or require further environmental review to make their decisions about the project and the permits they have the authority to grant.

- ***U.S. Army Corps of Engineers (USACE)*** – regulates “Waters of the U.S.” under Section 404 of the Federal Clean Water Act (Section 404 permit) and navigable waters under Section 10 of the Rivers and Harbors Act. The project would include activities that would modify wetland habitat and minor drainages that are potential Waters of the U.S. subject to Corps jurisdiction. Any project activities that could directly affect these wetlands and drainages would require authorization from the USACE, either under a Nationwide or Individual Permit.
- ***U.S. Fish and Wildlife Service (USFWS)*** – administers the Federal Endangered Species Act and the Marine Mammal Protection Act. The USFWS operates under a number of statutory and administrative authorities. It has responsibility for protecting listed special status species and for conducting Section 7 consultations and granting relevant permits if activities involved with a project would result in the "take" of a listed species. The USFWS is an advisory agency to the Army Corps of Engineers on Section 404 and Section 10 projects.

- ***NOAA Fisheries (NOAA)*** – administers the Federal Endangered Species Act and the Marine Mammal Protection Act. NOAA operates under a number of statutory and administrative authorities. It has responsibility for protecting listed special status species and for conducting Section 7 consultations and granting relevant permits if activities involved with a project would result in the "take" of a listed fish species that is anadromous in nature (i.e., salmon and steelhead species). NOAA is an advisory agency to the Army Corps of Engineers on Section 404 and Section 10 projects.
- ***California Department of Fish and Game (CDFG)*** – has authority to oversee work done in streams pursuant to California Fish and Game Code Sections 1601 and 1603. Project modification of permanent and seasonal drainages would require approval of a Streambed Alteration Agreement. Such an agreement would require that there be no net loss of wildlife habitat values or that lost acreage would be replaced. CDFG also has the authority to comment on Corps permits. Any waterway subject to CDFG jurisdiction is subject to Corps regulations. A Streambed Alteration Agreement would be a prerequisite for obtaining any Corps permit. The CDFG is also responsible for the protection of plant and wildlife populations and for overseeing the California Endangered Species Act. CDFG would require approval of a Mitigation Agreement and Mitigation Plan for plants listed as rare under the Native Plant Protection Act.
- ***Regional Water Quality Control Board (RWQCB)*** – has jurisdiction over discharges affecting water quality. The RWQCB regulates discharges to waterways and wetlands through the adoption of Waste Discharge Requirements (WDR) and National Pollution Discharge Elimination System (NPDES) permits. Projects must comply with General Construction Activity Stormwater Permit requirements. The RWQCB may use the EIR to determine project consistency with the General Construction Permit requirements. The RWQCB issues the State certification for any required Corps permit. The RWQCB also has regulatory authority in connection with the CDFG's Streambed Alteration Agreement to grant Water Quality Certification (or Waiver) to cover any in-channel or wetland construction work related to the project.
- ***Bay Area Air Quality Management District (BAAQMD)*** – has jurisdiction over regional air quality issues. BAAQMD will review the EIR to ensure that the project is consistent with its regulations.

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CHAPTER 4.0
ENVIRONMENTAL IMPACT ANALYSIS

This chapter contains an analysis of each potentially significant environmental issue identified in the NOP prepared for the proposed project and, as such, constitutes the major portion of the ~~Draft~~ EIR. Sections 4.1 through 4.12 of this chapter describe the environmental setting of the project as it relates to each specific issue, the impacts resulting from implementation of the project, and the mitigation measures that would avoid or reduce impacts of the project to a less-than-significant level.

Determination of Significance

Under CEQA, a significant effect is defined as a substantial, or potentially substantial, adverse change in the environment.[12] The *CEQA Guidelines*[13] direct that this determination be based on scientific and factual data. Each impact evaluation in this chapter is prefaced by criteria of significance, which are the thresholds for determining whether an impact is significant. These criteria of significance are derived from Appendix G of the *CEQA Guidelines*, the Marin County Environmental Impact Review Guidelines, and criteria expressed through the policies contained in the Marin Countywide Plan (CWP).

Issues Addressed in the ~~Draft~~ EIR

The following environmental issues are addressed in this chapter:

4.1 Land Use and Planning Policy
4.2 Aesthetics
4.3 Biological Resources
4.4 Cultural Resources
4.5 Geology and Soils
4.6 Hydrology and Water Quality
4.7 Hazards and Hazardous Materials
4.8 Traffic and Circulation
4.9 Air Quality
4.10 Noise
4.11 Public Services and Utilities
4.12 Global Climate Change

It was determined that this project would not have a significant effect on population, employment and housing; agricultural resources; and mineral resources. As a result, these issues have not been investigated further in this chapter of the ~~Draft~~ EIR, but are briefly addressed in Chapter 6.0, CEQA Required Assessment Conclusions, in the subsection Effects Found Not to Be Significant.

[12] Public Resources Code §21068
[13] California State of, Governor's Office of Planning and Research. *California Environmental Quality Act Statutes and Guidelines.* 2007

Format of Issue Sections

Each environmental issue section has four main subsections: (1) Setting; (2) Regulatory Framework; (3) Significance Criteria; and (4) Impacts and Mitigation Measures. Each impacts and mitigation measures subsection is further subdivided into a discussion of the *less-than-significant* impacts and a subsequent discussion of *significant* impacts. Any identified significant impacts are numbered and shown in bold type. And the corresponding mitigation measures are numbered and indented. Significant impacts and mitigation measures are numbered consecutively within each topic and begin with a shorthand abbreviation for the impact section (e.g., LU for land use). The following symbols are used for individual topics:

LU: Land Use
AES: Aesthetics
BIO: Biological Resources
CULT: Cultural Resources
GEO: Geology and Soils
HYD: Hydrology and Water Quality
HAZ: Hazards and Hazardous Materials
TR: Traffic and Circulation
AIR: Air Quality
NOI: Noise
PUB: Public Services
GCC: Global Climate Change

The following notations are provided after each identified significant impact and after identification of mitigation measures:

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

These notations indicate the significance of the impact before and after mitigation.

4.1 LAND USE AND PLANNING POLICY

This section of the EIR discusses the proposed project's consistency with relevant public plans and policies. The analysis included in this section is the EIR preparer's best judgment (in consultation with County staff) of policy consistency. However, the EIR does not determine policy consistency. The formal policy consistency must be made by County decision makers.

The consistency analysis is presented to assist decision-makers when they make their formal determinations of the proposed project's consistency with relevant policies. When the possibility of inconsistency is identified in the EIR, it is described as an "inconsistency" or "possible inconsistency" to focus attention to that policy issue.

It is not within the purview of an EIR to make final determinations of General Plan consistency, as such determinations are "quasi-legislative" in nature and require the County to evaluate whether, "considering all [the project's] aspects, it will further the objectives and policies of the general plan an not obstruct their attainment."

It is therefore the responsibility of Marin County's decision-makers to make the definitive decisions about policy consistency when the merits of the project are considered. The decision-makers have the sole authority to determine whether and how relevant policies apply to a specific project.

Inconsistency with policies are not environmental impacts, since determination of inconsistencies with General Plan or other plan policies are legal in nature and not an environmental impact (since a plan is not part of the physical environment).

4.1.1 Setting

The following section describes existing land use conditions within the project site and its vicinity.

Land Uses within the Project Site. The project site is a two-lane section of SFDB between Platform Bridge Road and Shafter Bridge that is maintained by the County of Marin. The County's right-of-way is 60 feet wide centered on the roadway centerline. The site is largely covered with concrete pavement and/or asphalt concrete paving. Areas immediately adjacent to the roadway are either wooded or vegetated with annual grassland or scrub habitat.

Land Uses in the Vicinity of the Project Site. Land use in the project vicinity is primarily parkland comprised of open areas in their natural state and recreational uses and activities such as camping, picnicking, hiking, bicycle and horseback riding, and nature observation. The majority of the land adjacent to the project site (roadway) is owned by the State of California and the federal government and is administered as a State park (Samuel P. Taylor State Park) and a federal recreation area (Golden Gate National Recreation Area). A working ranch, the McIsaac Ranch, is located at the western end of the project site along the north side of SFDB and is used for cattle ranching. A small number of residences at the west-end of the project site are used as housing for State Park employees, are leased out for private use, or are idle and not in current use. Camping facilities are located within Samuel P. Taylor State Park, south of SFDB.

4.1.2 Regulatory Framework

The main guiding documents regulating land use within and around the project site are the Marin Countywide Plan[14], the Marin County Development Code[15], and the Marin County Unincorporated Area Bicycle and Pedestrian Master Plan[16]. The Point Reyes National Seashore and Golden Gate National Recreation Area (GGNRA) General Management Plan[17] is also relevant to the proposed project, as the project site is located within the GGNRA.

The consistency of the project with other non-land use related policies is addressed in the appropriate topical sections of the EIR (e.g., Air Quality). Applicable land use policies from each of the documents listed above are described below.

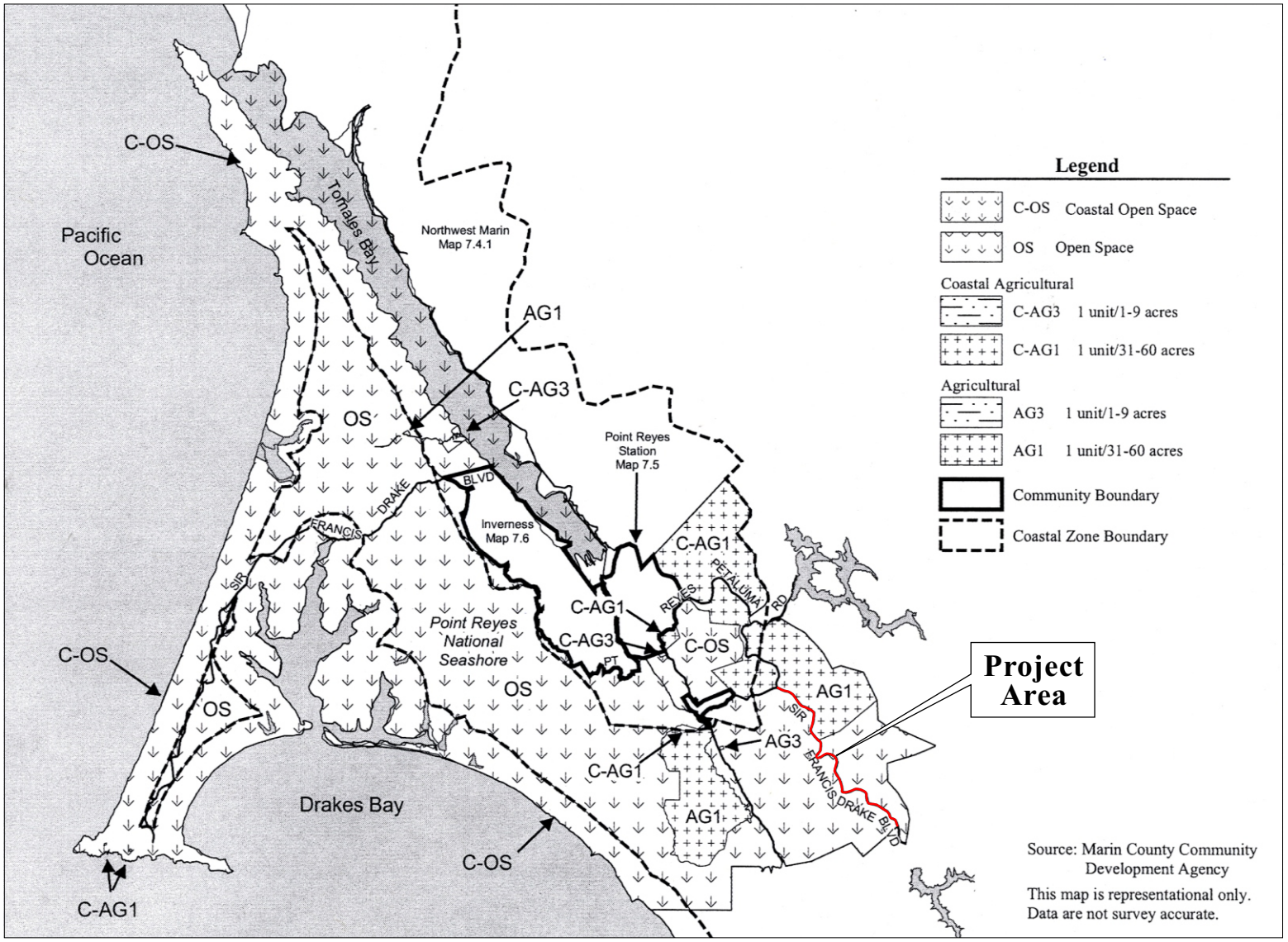
Marin Countywide Plan. The Marin Countywide Plan is a comprehensive plan for the protection of environmental quality and natural resources, existing and future development, and use of land in the County. The Marin CWP is an expression of community values. The current CWP was adopted by the Board of Supervisors on November 6, 2007. The CWP serves as the comprehensive guide for making decisions about land use, economic development, road improvements, and protection of natural resources and public health and safety. It also provides the legal foundation for all zoning, subdivision, and public facilities decisions and projects.

The project site is located about one mile west of the Town of Lagunitas within the West Marin Planning Area. The West Marin Planning area lies within the Inland Rural Corridor as designated by the Marin Countywide Plan. The Inland Rural Corridor is one of four environmental corridors established by the Marin CWP based on natural features and appropriate land uses. The Inland Rural Corridor includes the central and northwestern part of Marin County, which is designated for agriculture and other compatible land uses. It encompasses two environmental zones: a belt of inland valleys and upland meadows and the County's central range of mountains with primarily recreational access.

The majority of the land within the project area is designated as Open Space (OS) (Figure 4.1-1). The Open Space designation is applied to lands in public ownership for open space purposes, such as recreation, watershed, and habitat protection and management. It also applies to private lands subject to deed restrictions or other agreements limiting them to open space and compatible uses. Lands designated Open Space are subject to a floor area ratio (FAR) of 0.01 to 0.09 (i.e., very low density development that preserves open space).

Other lands in the vicinity of the project site (roadway) are designated as Agriculture 1 (AG-1). Agriculture land use categories are established to preserve and protect a variety of agricultural uses, and to enable the potential for agricultural production and diversification. Historically, 60 acres has been the minimum parcel size for most agricultural lands in the county. The Agriculture 1 land use category is established for agricultural uses, including nonresidential structures necessary for agricultural operations at a FAR of 0.01 to 0.09, and housing with a density of one dwelling unit per 31 to 60 acres.

[14] Marin County Community Development Agency, 2007. *Marin Countywide Plan*.
[15] Marin County, 2008. Marin County Development Code.
[16] Marin County, 2001. Marin County Unincorporated Area Bicycle and Pedestrian Master Plan. February.
[17] National Park Service, 1980. Point Reyes National Seashore and Golden Gate National Recreation Area General Management Plan, September. http://www.nps.gov/history/history/online_books/goga/goga_gmp.pdf



LSA

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NOT TO SCALE

FIGURE 4.1-1

Sir Francis Drake Roadway Improvements Project

Land Use Designations

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Table 4.1.A discusses the project's consistency, potential inconsistency, or inconsistency, with relevant policies of the 2007 Marin Countywide Plan. Applicable policies and programs related to Geology, Soils, and Seismicity, Hazardous Materials; Hydrology and Water Quality; Biological Resources; Transportation and Circulation; Air Quality; and Visual Quality are also discussed in those topical sections of the EIR.

To assess consistency, the discussion in Table 4.1.A uses the terms *consistent, potentially inconsistent*, and *inconsistent*. These terms are defined as follows:

- *Consistent* is used when the proposed project, taking into consideration mitigation measures, would comply with all the requirements of the relevant policy or regulation.
- *Potentially Inconsistent* is used when it is unclear whether the entire project is in conflict with the policy or regulation.
- *Inconsistent* is used when the entire project would or may conflict with any part of policy or regulation

Marin County Development Code and Marin County Zoning Ordinance. The broad purposes of the Marin Development Code are to protect and promote the public health, safety, comfort, convenience, prosperity, and general welfare of residents and businesses in Marin County and to implement the policies of the Marin Countywide Plan. The Development Code is used in conjunction with the Zoning Ordinance to classify and regulate the uses of land and structures within the unincorporated areas of Marin County.

The majority of land in the project area is designated Open Area (OA), with a small portion designated Agriculture (A60) in the County's Zoning Ordinance. Allowable uses within these zoning designations include:

- *Open Area* permits resource and open space uses such as fish hatcheries and game reserves, nature preserves, and water conservation dams and ponds. Limited agricultural uses, including agricultural accessory structures, commercial gardening, crop production, dairy operations, and livestock grazing are also allowed.
- *Agriculture 60* allows for most agricultural, resource and open space uses, including agricultural processing and accessory activities, commercial gardening, livestock operations and grazing, fish hatcheries, and nature preserves.

Table 4.1.A: Relationship of Project to Marin Countywide Plan Policies

Element and Goal, Policy or Implementing Program Number	Goal, Policy or Implementing Program Language	Project Consistency
Biological Resources		
Goal BIO-1	**Enhanced Native Habitat and Biodiversity.** Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout the County.	**Consistent.** As documented in Chapter 4.3 of the ~~Draft~~ EIR, background research and reports have been completed to identify sensitive biological resources onsite, including wetlands, special-status species and native trees. Qualified biologists have conducted analyses in order to determine the potential for project impacts on these resources and appropriate mitigation measures to minimize the potential for significant impacts.
Policy BIO-1.1	**Protect Wetlands, Habitat for Special-Status Species, Sensitive Natural Communities, and Important Wildlife Nursery Areas and Movement Corridors.** Protect sensitive biological resources, wetlands, migratory species of the Pacific flyway, and wildlife movement corridors through careful environmental review of proposed development applications, including consideration of cumulative impacts, participation in comprehensive habitat management programs with other local and resource agencies, and continued acquisition and management of open space lands that provide for permanent protection of important natural habitats.	**Consistent.** Section 4.3 of this EIR describes the biological resources of the project site, evaluates the proposed project's potential impacts on those resources, and identifies appropriate mitigation measures to minimize those impacts. The proposed project has been designed to minimize potential environmental impacts. However, as described in Section 4.3, the project has the potential to adversely affect special status plant and animal species, native trees, and jurisdictional features (i.e., seasonal wetlands, streams). Implementation of mitigation measures identified in this EIR would reduce impacts to less than significant levels. Therefore, the proposed project would be consistent with County policies to protect wetlands, habitat for special-status species, and other sensitive biological resources.
Policy BIO-1.3	**Protect Woodlands, Forests, and Tree Resources.** Protect large native trees, trees with historical importance; oak woodlands; healthy and safe eucalyptus groves that support colonies of monarch butterflies, colonial nesting birds, or known raptor sites; and forest habitats. Prevent the untimely removal of trees through implementation of standards in the Development Code and the Native Tree Preservation and Protection Ordinance. Encourage other local agencies to adopt tree preservation ordinances to protect native trees and woodlands, regardless of whether they are located in urban or undeveloped areas. See also Policy SV-1.7.	**Consistent.** As stated in Section 4.3, implementation of the proposed project would result in the removal of approximately 8 trees associated with slope repair at Station 270+25 and 9 trees with implementation of Option A. In addition, construction activities could indirectly affect native trees by damaging roots, compacting the soil, and altering drainage patterns. In accordance with the Marin County Code and the Native Tree Preservation and Protection Ordinance, mitigation measures BIO-8 and BIO-9 require that trees be replaced and tree be protected during project construction. *With implementation of these mitigation measures, the proposed project would be consistent with Policy BIO-1.3*.
Goal BIO-2	**Protection of Sensitive Biological Resources.** Require identification of sensitive biological resources and commitment to adequate protection and mitigation, and monitor development trends and resource preservation efforts.	**Consistent.** As part of the project's environmental review process, a Biological Assessment was completed by Synthesis and amended by LSA to determine the nature and extent of the resources on the site, how the proposed project would affect sensitive biological resources, and what coordination would likely be required with responsible resource agencies. The analysis identified potential impacts that the project could have on special status plant and wildlife species, native trees, and jurisdictional features (i.e., wetlands, streams).

		Mitigation measures identified in Section 4.3, Biological Resources, would reduce potential impacts on relevant resources to a less than significant level. As a result, the project would be consistent with the County's efforts to address resource preservation through the environmental review process.
Policy BIO-2.1	**Include Resource Preservation in Environmental Review.** Require environmental review pursuant to CEQA of development applications to assess the impact of proposed development on native species and habitat diversity, particularly special-status species, sensitive natural communities, wetlands, and important wildlife nursery areas and movement corridors. Require adequate mitigation measures for ensuring the protection of any sensitive resources and achieving "no net loss" of sensitive habitat acreage, values, and function.	**Consistent.** See above.
Policy BIO-2.2	**Limit Development Impacts.** Restrict or modify proposed development in areas that contain essential habitat for special-status species, sensitive natural communities, wetlands, baylands and coastal habitat, and riparian habitats, as necessary to ensure the continued health and survival of these species and sensitive areas. Development projects should preferably be modified to avoid impacts on sensitive resources, or to adequately mitigate impacts by providing on-site or (as a lowest priority) off-site replacement at a higher ratio.	**Consistent.** The project has been designed to minimize potential impacts on sensitive biological resources, including wetlands and special status species. However, as described in Section 4.3, Biological Resources, construction of the proposed project could affect special status plant and animal species, native trees, and seasonal wetlands. Mitigation measures identified in Section 4.3 would reduce potential impacts on these resources to a less than significant level. Based on the combination of mitigation measures established to reduce potential impacts to sensitive biological resources, the project is consistent with the County's efforts to limit adverse impacts from development.
Policy BIO 2.3	**Preserve Ecotones.** Condition or modify development permits to ensure that ecotones, or natural transitions between habitat types, are preserved and enhanced because of their importance to wildlife. Ecotones of particular concern include those along the margins of riparian corridors, baylands and marshlands, vernal pools, and woodlands and forests where they transition to grasslands and other habitat types.	**Consistent.** As described in Section 4.3, implementation of the proposed project would impact riparian habitat along Lagunitas Creek as a result of construction activities associated with roadway repair and replacement of existing culverts. Mitigation measures identified in Section 4.3 would reduce potential impacts on riparian areas to a less than significant level. Further, implementation of the drainage improvements included as part of the proposed project would prevent slope and road failure, which currently contribute sediment and roadway aggregate to surface waters.
Policy BIO-2.4	**Protect Wildlife Nursery Areas and Movement Corridors.** Ensure that important corridors for wildlife movement and dispersal are protected as a condition of discretionary permits, including consideration of cumulative impacts. Features of particular importance to wildlife for movement may include riparian corridors, shorelines of the coast and bay, and ridgelines. Linkages and corridors shall be provided that connect sensitive habitat areas such as woodlands, forests, wetlands, and essential habitat for special-status species, including an assessment of cumulative impacts.	**Consistent.** As described in Section 4.3, implementation of the proposed project would impact the use of the site as a wildlife movement corridor during the construction period. However, these impacts would be short-term (approximately six months) and would occur only during daylight hours when construction activities occur. Upon completion, Sir Francis Drake Boulevard will be similar in size and scale to the existing roadway. Therefore, it is anticipated that wildlife would continue to use the project site as a wildlife movement corridor after rehabilitation of the roadway is complete. Installation of bioswale structures along portions of the rehabilitated

		roadway would permanently remove some upgraded culverts from use as wildlife movement corridors by small mammals, amphibians, and reptiles. The loss of these culverts as potential wildlife movement locations would reduce the overall wildlife movement corridors available in the project study area. However, removal of these culverts would not be considered significant because a significant number of culverts would remain for wildlife movement after construction is complete, and wildlife would continue to be able to cross SFDB if necessary. Additionally, the project will improve potential wildlife movement capacity for at least 26 of the project's 72 culverts that will be upgraded to larger diameters.
Policy BIO-2.5	**Restrict Disturbance in Sensitive Habitat During Nesting Season.** Limit construction and other sources of potential disturbance in sensitive riparian corridors, wetlands, and baylands to protect bird nesting activities. Disturbance should generally be set back from sensitive habitat during the nesting season from March 1 through August 1 to protect bird nesting, rearing, and fledging activities. Preconstruction surveys should be conducted by a qualified professional where development is proposed in sensitive habitat areas during the nesting season, and appropriate restrictions should be defined to protect nests in active use and ensure that any young have fledged before construction proceeds.	**Consistent.** As described in Section 4.3, nesting birds could be affected by the project. The removal of trees and other site preparation activities could destroy active nests, harm individual birds, or cause nest abandonment. Mitigation Measure BIO-4 would reduce this potentially significant impact to a less than significant level. With the implementation of these mitigation measures, the project would be consistent with County policy to minimize disturbance to sensitive habitat during the nesting season.
Policy BIO-2.6	**Identify Opportunities for Safe Wildlife Movement.** Ensure that existing stream channels and riparian corridors continue to provide for wildlife movement at roadway crossings, preferably through the use of bridges, or through over-sized culverts, while maintaining or restoring a natural channel bottom. Consider the need for wildlife movement in designing and expanding major roadways and other barriers in the county. Of particular concern is the possible widening of Highway 101 north of Novato to the county line, where maintenance of movement opportunities for terrestrial wildlife between the undeveloped habitat on Mount Burdell and the marshlands along the Petaluma River is critical.	**Consistent.** See response to Policy BIO-2.4 above.
Policy BIO-2.8	**Coordinate with Trustee Agencies.** Consult with trustee agencies (the California Department of Fish and Game, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration Fisheries, U.S. Army Corps of Engineers, Environmental Protection Agency, Regional Water Quality Control Board, and Bay Conservation and Development Commission) during environmental review when special-status species, sensitive natural communities, or wetlands may be adversely affected.	**Consistent.** Prior to preparation of the EIR all trustee agencies received a Notice of Preparation and were asked to submit comments on environmental concerns. As part of the CEQA review process and as required by Mitigation Measure BIO-10 identified in Section 4.3, the appropriate permits and approvals would be obtained from responsible agencies, including the California Department of Fish and Game, U.S. Army Corps of Engineers, and the Regional Water Quality Control Board.
Policy BIO-2.9	**Promote Early Consultation with Other Agencies.** Require applicants to consult with all agencies with review authority for projects in areas supporting wetlands and special-status species at the outset of project planning.	**Consistent.** As described above, prior to preparation of the EIR, all trustee agencies were given the opportunity to comment on potential environmental concerns related to the proposed project. These agencies will again have an opportunity to comment on this EIR during the public review period.

Program BIO-2.a	**Require Site Assessments.** Require site assessment by a qualified professional for development applications that may adversely affect sensitive biological or wetland resources, including jurisdictional wetlands, occurrences of special-status species, occurrences of sensitive natural communities, and important wildlife nursery areas and movement corridors. The assessment should determine the presence or absence of any sensitive resources that could be affected by development, evaluate the potential impacts, and identify measures for protecting the resource and surrounding habitat. Require the assessment to be conducted by a qualified professional paid for by the applicant. Unless waived, the qualified professional should be hired directly by Marin County.	**Consistent.** As described in Section 4.3, a Biological Assessment for the proposed project was prepared by Synthesis Environmental Planning in July 2009 and updated by LSA in October 2009. As part of preparing the Biological Assessment, Synthesis conducted a literature review and field surveys to identify special-status plant and wildlife species and sensitive habitats in the project area. The Biological Assessment also identifies potential impacts associated with implementation of the proposed project, as well as mitigation measures required to reduce these impacts to less than significant levels. Based on the preparation of the Biological Assessment by a qualified professional, the project is consistent with the County's efforts to require site assessments.
Goal BIO-3	**Wetland Conservation.** Require all feasible measures to avoid and minimize potential adverse impacts on existing wetlands and to encourage programs for restoration and enhancement of degraded wetlands.	**Consistent.** As described in Section 4.3, Biological Resources, the proposed project would result in permanent and temporary impacts to wetland and stream resources in the project area. Mitigation Measure BIO-10 requires that DPW minimize temporary disturbances to stream banks to the smallest amount feasible needed to accomplish culvert replacement, bank stabilization and slope repair work and to restore disturbed areas to pre-disturbance conditions after temporary project activities are complete. Mitigation Measure BIO-10 also requires that DPW compensate for the loss of 0.24 acre of seasonal wetland by establishing new wetlands within the watershed at a ratio of 2:1. With implementation of this mitigation measure, the project is consistent with the County's efforts to conserve wetlands.
Policy BIO-3.1	**Protect Wetlands.** Require development to avoid wetland areas so that the existing wetlands and upland buffers are preserved and opportunities for enhancement are retained (areas within setbacks may contain significant resource values similar to those within wetlands and also provide a transitional protection zone). Establish a Wetland Conservation Area (WCA) for jurisdictional wetlands to be retained, which includes the protected wetland and associated buffer area. Development shall be set back a minimum distance to protect the wetland and provide an upland buffer. Larger setback standards may apply to wetlands supporting special-status species or associated with riparian systems and baylands under tidal influence, given the importance of protecting the larger ecosystems for these habitat types as called for under Stream Conservation and Baylands Conservation policies defined in Policy BIO-4.1 and BIO-5.1, respectively. Regardless of parcel size, a site assessment is required either where incursion into a WCA is proposed or where full compliance with all WCA criteria would not be met. Employ the following criteria when evaluating development projects that may impact wetland areas:	**Consistent.** The proposed roadway rehabilitation project as designed limits the paved width of the roadway based on the proximity of environmental resources and sensitive riparian zones. The proposed project is within the boundaries of the existing right-of-way and no right-of way expansion into nearby sensitive resources is proposed. The wetlands affected by the proposed project are located in existing roadway drainage channels which have been cleared from time to time to reduce flooding of travel lanes. To the extent feasible the proposed project avoids riparian zones and associated wetlands thereby limiting project impacts on watershed resources. As described in Section 4.3, Biological Resources, the proposed project would result in permanent and temporary impacts to wetland and stream resources in the project area. Mitigation Measure BIO-10 requires that DPW minimize temporary disturbances to stream banks to the smallest amount feasible needed to accomplish culvert replacement, bank stabilization and slope repair work and to restore disturbed areas to pre-disturbance conditions after temporary project activities are complete. Mitigation Measure BIO-10 also requires that DPW compensate for the loss of 0.24 acre of seasonal wetland by establishing new wetlands within the watershed

	Coastal, Inland Rural, and Baylands Corridors: For all parcels, provide a minimum 100-foot development setback from wetlands (areas within setbacks may contain significant resource values similar to those within wetlands and also provide a transitional protection zone). An additional buffer may be required, based on the results of a site assessment, if such an assessment is determined to be necessary. Site assessments will be required and conducted pursuant to Program BIO-3.c, Require Site Assessment. Exceptions to full compliance with the WCA setback standards may apply only in the following cases: 1. Parcel is already developed with an existing use, provided no unauthorized fill or other modifications to wetlands have occurred as part of ongoing use of the property. 2. Parcel is undeveloped and falls entirely within the WCA. 3. Parcel is undeveloped and potential impacts on water quality, wildlife habitat, or other sensitive resources would be greater as a result of development outside the WCA than development within the WCA, as determined by a site assessment. 4. Wetlands are avoided and a site assessment demonstrates that minimal incursion within the minimum WCA setback distance would not result in any significant adverse direct or indirect impacts on wetlands.	at an on-site replacement ratio of 2:1. With implementation of this mitigation measure, the project is consistent with the County's efforts to protect wetlands. The proposed project is the rehabilitation of an existing roadway that is an integral part of the County's overall roadway network. Given that the proposed project is the rehabilitation of an existing roadway with minimum pavement expansion, the proposed project would be exempt from WCA setback and buffer standards and is therefore consistent with the provisions of the WCA.
Policy BIO-3.2	**Require Thorough Mitigation.** Where avoidance of wetlands is not possible, require provision of replacement habitat on-site through restoration and/or habitat creation at a minimum ratio of 2 acres for each acre lost (2:1 replacement ratio) for on-site mitigation and a minimum 3:1 replacement ratio for off-site mitigation. Mitigation wetlands should be of the same type as those lost and provide habitat for the species that use the existing wetland. Mitigation should also be required for incursion within the minimum WCA setback/transition zone.	**Consistent.** Mitigation Measure BIO-10 requires that DWP compensate for the loss of 0.24 acre of seasonal wetland associated with roadside swales by establishing new seasonal wetlands at a 2:1 on-site replacement ratio within the Lagunitas Creek watershed in which the project is located. With implementation of this mitigation measure, the project would be consistent with the County's policy to mitigate for loss of wetlands.
Program BIO-3.b	**Comply with Regulations to Protect Wetlands.** Continue to require development applications to include the submittal of a wetland delineation for sites with jurisdictional wetlands and to demonstrate compliance with these wetlands policies, standards, and criteria, and with State and federal regulations.	**Consistent.** A delineation of wetlands and watercourses within the project study area was conducted by Synthesis Environmental Planning in 2007. Mitigation Measure BIO-10 requires compliance with County, State, and federal regulations including compensation for loss of wetlands and protection of wetlands within the project area. With implementation of this mitigation measure, the project would be consistent with the County's policy to comply with wetland regulations.
Program BIO-3.c	**Require Site Assessment.** Require development applications to include the submittal of a site assessment prepared by a qualified professional where incursions into the WCA are proposed, or adverse impacts to wetlands resources may otherwise occur. The assessment should be considered in determining whether any adverse direct or indirect impacts on wetlands would occur as a result of the proposed development, whether wetlands	**Consistent.** As described in Section 4.3, a Biological Assessment for the proposed project was prepared by Synthesis Environmental Planning in July 2009 and updated by LSA in October 2009. As part of preparing the Biological Assessment, Synthesis conducted a literature review and field surveys to identify special-status plant and wildlife species and sensitive habitats in the project area. The Biological Assessment also identifies

	criteria and standards are being met, and to identify measures necessary to mitigate any significant impacts. The site assessment may also serve as a basis for the County to apply restrictions in addition to those required by State and federal regulations. The site assessment shall be paid for by the applicant. Unless waived, the qualified professional shall be hired directly by Marin County.	potential impacts associated with implementation of the proposed project, as well as mitigation measures required to reduce these impacts to less than significant levels. Based on the preparation of the Biological Assessment by a qualified professional, the project is consistent with the County's efforts to require site assessments.
Goal BIO-4	**Riparian Conservation.** Protect and, where possible, restore the natural structure and function of riparian systems.	**Consistent.** Section 4.3, Biological Resources, describes the extent of riparian habitat within the project area, potential impacts to riparian systems as a result of the proposed project, and appropriate mitigation measures to minimize significant impacts. Accordingly, the proposed project is consistent with the County's riparian conservation policy.
Policy BIO-4.1	**Restrict Land Use in Stream Conservation Areas.** A Stream Conservation Area (SCA) is established to protect the active channel, water quality and flood control functions, and associated fish and wildlife habitat values along streams. Development shall be set back to protect the stream and provide an upland buffer, which is important to protect significant resources that may be present and provides a transitional protection zone. Best management practices1 shall be adhered to in all designated SCAs. Best management practices are also strongly encouraged in ephemeral streams not defined as SCAs. Exceptions to full compliance with all SCA criteria and standards may be allowed only if the following is true: 1) A parcel falls entirely within the SCA; or 2) Development on the parcel entirely outside the SCA either is infeasible or would have greater impacts on water quality, wildlife habitat, other sensitive biological resources, or other environmental constraints than development within the SCA. SCAs are designated along perennial, intermittent, and ephemeral streams as defined in the Countywide Plan Glossary. Regardless of parcel size, a site assessment is required where incursion into an SCA is proposed or where full compliance with all SCA criteria would not be met. An ephemeral stream is subject to the SCA policies if it: (a) supports riparian vegetation for a length of 100 feet or more, and/or (b) supports special-status species and/or a sensitive natural community type, such as native grasslands, regardless of the extent of riparian vegetation associated with the stream. For those ephemeral streams that do not meet these criteria, a minimum 20-foot development setback should be required. SCAs consist of the watercourse itself between the tops of the banks and a strip of land extending laterally outward from the top of both banks to the widths defined below (see Figure 2-2). The SCA encompasses any jurisdictional wetland or unvegetated other waters within the stream	**Consistent.** This stretch of SFDB follows Lagunitas Creek and lies within a Stream Conservation Area (SCA) as defined in Figure 2-2 of the Countywide Plan. The right-of-way in which the existing roadway is located is also within the SCA. The project as proposed and with the implementation of recommended mitigation measures will utilize Best Management Practices to protect Lagunitas Creek and its environs. The proposed project, including Option A, would rehabilitate an existing roadway and in so doing will eliminate existing conditions that are currently detrimental to local water quality and stream environs. Project components include repaving the existing deteriorated roadway that is crumbling into the adjacent riparian zone and eventually into Lagunitas Creek; replacing culverts that can not adequately convey stormwater causing water to flow over the existing deteriorated roadway surface leaching out oil and grease from the roadway and depositing the contaminants into Lagunitas Creek, slope repair that will eliminate a current source of silt and roadway material that enters the stream environs and eventually the creek, and closing a series of pullouts that currently are used for vehicle parking that results in the deposition of vehicle contaminants that eventually enter the creek environs. The proposed project would improve roadway surface conditions, install water quality treatment bioswales designed to improve the quality of water entering Lagunitas Creek, and repair/replace existing culverts so that road runoff does not contribute to slope instability and results in water quality improvements. The proposed project also includes slope repair in one area by replacing subsurface materials with engineered fill and constructing a down-slope retaining wall to stabilize the slope. Mitigation measures are included in this EIR to protect and preserve riparian vegetation and aquatic resources in the project area. The SCA benefits associated with the proposed rehabilitation of an existing deteriorated

	channel, together with the adjacent uplands, and supersedes setback standards defined for WCAs. Human-made flood control channels under tidal influence are subject to the Bayland Conservation policies. The following criteria shall be used to evaluate proposed development projects that may impact riparian areas: Coastal, Inland Rural, and Baylands Corridors: For all parcels, provide a development setback on each side of the top of bank that is the greater of either (a) 50 feet landward from the outer edge of woody riparian vegetation associated with the stream or (b) 100 feet landward from the top of bank. An additional setback distance may be required based on the results of a site assessment. A site assessment may be required to confirm the avoidance of woody riparian vegetation and to consider site constraints, presence of other sensitive biological resources, options for alternative mitigation, and determination of the precise setback. Site assessments will be required and conducted pursuant to Program BIO-4.g, Require Site Assessment. SCAs shall be measured as shown in Figure 2-2. Allowable uses in SCAs in any corridor consist of the following, provided they conform to zoning and all relevant criteria and standards for SCAs: • Existing permitted or legal nonconforming structures or improvements, their repair, and their retrofit within the existing footprint; • Projects to improve fish and wildlife habitat; • Driveway, road and utility crossings, if no other location is feasible; • Water-monitoring installations; • Passive recreation that does not significantly disturb native species; • Necessary water supply and flood control projects that minimize impacts to stream function and to fish and wildlife habitat; • Agricultural uses that do not result in any of the following: a. The removal of woody riparian vegetation; b. The installation of fencing within the SCA that prevents wildlife access to the riparian habitat within the SCA; c. Animal confinement within the SCA; and d. A substantial increase in sedimentation.	roadway, combined with implementation of EIR recommended biological mitigation measures are consistent with the provisions of the County's SCA policies.
Policy BIO-4.2	**Comply with SCA Regulations.** Implement established setback criteria for protection of SCAs through established discretionary permit review processes and/or through adoption of new ordinances. Environmental review shall be required where incursion into an SCA is proposed and a discretionary permit is required. In determining whether allowable uses are	**Consistent.** As described in Sections 4.3 and 4.6, the proposed project could adversely affect the habitat and population of special-status species and degrade water quality during the construction period. Mitigation measures identified in this EIR would reduce these impacts to a less-than-significant level. Further, the proposed project would improve roadway surface

	compatible with SCA regulations, development applications shall not be permitted if the project does any of the following: • Adversely alters hydraulic capacity; • Causes a net loss in habitat acreage, value, or function; • Degrades water quality.	conditions, install water quality treatment bioswales designed to improve the quality of water entering Lagunitas Creek, and repair/replace existing culverts so that road runoff does not contribute to slope instability and results in water quality improvements. The proposed project also includes slope repair in one area by replacing subsurface materials with engineered fill and constructing a down-slope retaining wall to stabilize the slope. The SCA benefits associated with the proposed rehabilitation of an existing deteriorated roadway, combined with implementation of EIR recommended biological and water quality mitigation measures are consistent with the provisions of the County's SCA regulations.
Policy BIO-4.4	**Promote Natural Stream Channel Function.** Retain and, where possible, restore the hydraulic capacity and natural functions of stream channels in SCAs. Discourage alteration of the bed or banks of the stream, including filling, grading, excavating, and installation of storm drains and culverts. When feasible, replace impervious surfaces with pervious surfaces. Protect and enhance fish habitat, including through retention of large woody debris, except in cases where removal is essential to protect against property damage or prevent safety hazards. In no case shall alterations that create barriers to fish migration be allowed on streams mapped as historically supporting salmonids. Alteration of natural channels within SCAs for flood control should be designed and constructed in a manner that retains and protects the riparian vegetation, allows for sufficient capacity and natural channel migration, and allows for reestablishment of woody trees and shrubs without compromising the flood flow capacity where avoidance of existing riparian vegetation is not possible.	**Consistent.** The proposed project would improve road conditions, install water quality treatment bioswales and repair/replace existing culverts so that road runoff does not contribute to slope instability and results in water quality improvements. The proposed project also includes slope repair in one area by replacing subsurface materials with engineered fill and constructing a down-slope retaining wall to stabilize the slope. Mitigation measures included in this EIR also require the County to restore disturbed areas, protect sensitive biological resources including special status fish, amphibian and reptile species, and implement Best Management Practices to reduce stormwater runoff and protect water quality. With implementation of these mitigation measures, the project would be consistent with County policies to promote natural stream channel function.
Policy BIO-4.5	**Restore and Stabilize Stream Channels.** Pursue stream restoration and appropriate channel redesign where sufficient right-of-way exists that includes the following: a hydraulic design, a channel plan form, a composite channel cross-section that incorporates low flow and bankfull channels, removal and control of invasive exotic plant species, and biotechnical bank stabilization methods to promote quick establishment of riparian trees and other native vegetation.	**Consistent.** The proposed project would improve road conditions and repair/replace existing culverts so that discharge does not contribute to slope instability. The proposed project also includes slope repair in one area by replacing subsurface materials with engineered fill and constructing a down-slope retaining wall to stabilize the slope. In addition, Mitigation Measure BIO-10 requires that DPW minimize temporary disturbances to stream banks to the smallest amount feasible needed to accomplish culvert replacement, bank stabilization and slope repair work and to restore disturbed areas to pre-disturbance conditions after temporary project activities are complete. The proposed project with implementation of recommended mitigation measures would not alter Lagunitas Creek hydraulics and is consistent with the County's stream stabilization policies.
Policy BIO-4.7	**Protect Riparian Vegetation.** Retain riparian vegetation for stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.	**Consistent.** The proposed project would result in the removal of 8 trees associated with slope repair and 9 additional trees would be removed under Option A. The small number of trees that would be removed combined with their dispersed locations assures that sufficient vegetation will remain to maintain stabile stream banks, moderate water temperature, filter sediment,

		and provide for wildlife habitat. Mitigation Measure BIO-5c would ensure that tree remnants are used, if needed, as woody debris and in bio-engineered structures along Lagunitas Creek to enhance salmonid habitat. Additionally, Mitigation Measure BIO-8 requires that trees be replaced at a ratio of 3:1. Replacement trees could not be planted in the same place as the trees removed, but will be planted along a tributary stream within the Lagunitas Creek watershed thereby improving riparian habitat within the greater ecosystem. From an aesthetics perspective, the visual loss of a large redwood tree might be noticeable but would not significantly change the overall visual character of the project area.. Therefore, the project with the implementation of recommended mitigation would be consistent with County's riparian vegetation protection policies.
Policy BIO-4.14	**Reduce Road Impacts in SCAs.** Locate new roads and roadfill slopes outside SCAs, except at stream crossings, and consolidate new road crossings wherever possible to minimize disturbance in the SCA. Require spoil from road construction to be deposited outside the SCA, and take special care to stabilize soil surfaces.	**Consistent.** The proposed project would rehabilitate an existing roadway. It would not create a new road or road crossings. The proposed project would improve road conditions and repair/replace existing culverts to minimize runoff, slope instability, and erosion. The beneficial effects to the existing condition in the SCA from the proposed project are consistent with County policies to limit roadway impacts in the SCA.
Policy BIO-4.15	**Reduce Wet Weather Impacts.** Ensure that development work adjacent to and potentially affecting SCAs is not done during the wet weather or when water is flowing through streams, except for emergency repairs, and that disturbed soils are stabilized and replanted, and areas where woody vegetation has been removed are replanted with suitable species before the beginning of the rainy season.	**Consistent.** In accordance with Mitigation Measure HYDRO-1, project construction shall be scheduled to minimize ground disturbance during the rainy season. The project applicant shall: (1) Sequence construction activities to minimize the amount of time that soils remain disturbedm; (2) Stabilize all disturbed soils as soon as possible following the completion of ground disturbing work; and (3) Install erosion and sediment control BMPs prior to the start of any ground-disturbing activities. With implementation of this mitigation measures, the project would be consistent with County efforts to reduce wet weather impacts.
Policy BIO-4.20	**Minimize Runoff.** In order to decrease stormwater runoff, the feasibility of developing a peak stormwater management program shall be evaluated to provide mitigation opportunities such as removal of impervious surface or increased stormwater detention in the watershed.	**Consistent.** In accordance with Mitigation Measure HYDRO-1, the County shall prepare a SWPPP designed to reduce potential impacts to surface water quality through the project construction period. The SWPPP shall include, as applicable, Best Management Practices (BMPs) to minimize stormwater runoff as required in the California Stormwater Quality Association Stormwater Best Management Handbook-Construction.
Program BIO-4.f	**Identify Potential Impacts to Riparian Systems.** At the time of a development application, evaluate potential impacts on riparian vegetation and aquatic habitat, and incorporate measures to protect riparian systems into the project design and construction. Retain and minimize disturbance to woody and herbaceous riparian vegetation in SCAs and adjacent areas. (Tree growth may be cleared from the stream channel where removal is essential to protect against property damage or prevent safety hazards.)	**Consistent.** Section 4.3, Biological Resources, and Section 4.6, Hydrology and Water Quality of this EIR identify the potential impacts to riparian vegetation and aquatic habitat that could result from implementing the proposed project and outline appropriate mitigation measures to reduce those impacts to a less than significant level. With implementation of the mitigation measures identified in this EIR, the project would be consistent with County efforts to identify potential impacts to riparian systems.
Program BIO-4.g	**Require Site Assessment.** Require development applications to include the submittal of a site assessment prepared by a qualified professional where	**Consistent.** As described in Section 4.3, a Biological Assessment for the proposed project was prepared by Synthesis Environmental Planning in July

	incursions into the SCA are proposed, or adverse impacts to riparian resources may otherwise occur. Unless waived, the qualified professional shall be hired by Marin County. The site assessment shall be paid for by the applicant and considered in determining whether any adverse direct or indirect impacts on riparian resources would occur as a result of the proposed development, whether SCA criteria and standards are being met, and to identify measures necessary to mitigate any significant impacts. The site assessment may also serve as a basis for the County to apply restrictions in addition to those required by State and federal regulations.	2009 and updated by LSA in October 2009. As part of preparing the Biological Assessment, Synthesis conducted a literature review and field surveys to identify special-status plant and wildlife species and sensitive habitats in the project area. The Biological Assessment also identifies potential impacts associated with implementation of the proposed project, as well as mitigation measures required to reduce these impacts to less than significant levels. Based on the preparation of the Biological Assessment by a qualified professional, the project is consistent with the County's efforts to require site assessments.
Program BIO-4h	**Comply with SCA Criteria and Standards.** All development permit applications shall be reviewed for conformity with these SCA policies, criteria, and standards and in accordance with the California Environmental Quality Act. Proposals that do not conform to SCA policies, and cannot be modified or mitigated to conform, shall be denied. If a proposal involves the creation of a new parcel that is wholly or partially in an SCA, the land division shall be designed to ensure that no development occurs within the SCA.	**Consistent**. As described in the preceding, the proposed project would improve road conditions, install water quality treatment bioswales and repair/replace existing culverts so that road runoff does not contribute to slope instability and results in water quality improvements. The proposed project also includes slope repair in one area by replacing subsurface materials with engineered fill and constructing a down-slope retaining wall to stabilize the slope. Mitigation measures included in this EIR also require the County to restore disturbed areas, protect sensitive biological resources including special status fish, amphibian and reptile species, and implement Best Management Practices to reduce stormwater runoff and protect water quality. The SCA benefits associated with the proposed rehabilitation of an existing deteriorated roadway, combined with implementation of EIR recommended biological mitigation measures are consistent with the provisions of the County's SCA policies.
Program BIO-4p	**Implement NPDES Phase II.** Continue to implement NPDES Phase II permit requirements relating to peak flow controls to ensure that project related and cumulative impacts to peak flows are minimized or avoided through conditions on project approval as required by the ordinances.	**Consistent.** Mitigation Measure HYD-1 requires preparation of a SWPPP, consistent with the requirements of the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities. The SWPPP shall include Best Management Practices (BMPs) to reduce potential impacts to surface water quality during the construction period.
Water Resources		
Goal WR-1	**Healthy Watersheds.** Achieve and maintain proper ecological functioning of watersheds, including sediment transport, groundwater recharge and filtration, biological processes, and natural flood mitigation, while ensuring high-quality water	**Consistent.** The proposed project would rehabilitate an existing roadway. No change in land use would occur as a result of the proposed project. Construction activities associated with project implementation could affect natural resources, including streams and wetlands within the project area. However, mitigation measures provided in this EIR would reduce any potential impacts to a less than significant level. With implementation of these mitigation measures, the project would be consistent with County efforts to protect watersheds and aquifer recharge.
Policy WR-1.1	**Protect Watersheds and Aquifer Recharge.** Give high priority to the protection of watersheds, aquifer-recharge areas, and natural drainage systems in any consideration of land use.	**Consistent.** See above.
Program WR-1.e	**Require Restoration of Degraded Areas.** Require replanting of	**Consistent.** Mitigation Measure BIO-10 requires that the County restore

	vegetation and remediation of associated erosion in conjunction with requested land use approvals, especially those including roads and over-grazing on steep slopes.	disturbed areas to pre-disturbance conditions after temporary project activities are complete. With implementation of Mitigation Measure BIO-10, the project would be consistent with Program WR-1.e.
Goal WR-2	**Clean Water.** Ensure that surface and groundwater supplies are sufficiently unpolluted to support local natural communities, the health of the human population, and the viability of agriculture and other commercial uses. (Policies on water availability are found in the Public Facilities and Services Section of the Built Environment Element.)	**Consistent.** As described in Section 4.6, Hydrology and Water Quality, the proposed project would have a less than significant impact on groundwater supplies or recharge. However, construction activities could result in the release of pollutants into Lagunitas Creek. Mitigation Measure HYDRO-1 requires project compliance with the NPDES General Construction Permit, including preparation of a SWPPP and implementation of BMPs to minimize construction impacts on water quality. With implementation of this Mitigation Measure, the project would be consistent with County policies to ensure water supplies are clean.
Policy WR-2.1	**Reduce Toxic Runoff.** Reduce the volume of urban runoff from pollutants — such as pesticides from homes, golf courses, cleaning agents, swimming pool chemicals, and road oil — and of excess sediments and nutrients from agricultural operations.	**Consistent.** Proposed bioswales will provide for protection of water quality. In addition Mitigation Measure HYDRO-1 requires the County to prepare a SWPPP designed to reduce potential impacts to surface water quality through the project construction period. The SWPPP shall include, as applicable, all Best Management Practices (BMPs) consistent with the BMPs requirements in the California Stormwater Quality Association Stormwater Best Management Handbook-Construction. With implementation of Mitigation Measure HYDRO-1, the project would be consistent with County policies to protect water quality, including reducing pollutants in stormwater runoff and preventing excess sedimentation and erosion.
Policy WR-2.2	**Reduce Pathogen, Sediment, and Nutrient Levels.** Support programs to maintain pathogen and nutrient levels at or below target levels set by the Regional Water Quality Control Board, including the efforts of ranchers, dairies, agencies, and community groups to address pathogen, sediment, and nutrient management in urban and rural watersheds.	**Consistent.** See above.
Policy WR-2.3	**Avoid Erosion and Sedimentation.** Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and on-site sediment retention. Require developments to include on-site facilities for the retention of sediments, and, if necessary, require continued monitoring and maintenance of these facilities upon project completion.	**Consistent.** See above.
Policy WR-2.4	**Design County Facilities to Minimize Pollutant Input.** Design, construct, and maintain County buildings, landscaped areas, roads, bridges, drainages, and other facilities to minimize the volume of toxics, nutrients, sediment, and other pollutants in stormwater flows, and continue to improve road maintenance methods to reduce erosion and sedimentation potential.	**Consistent.** The proposed project is consistent with County policies to minimize pollutant input from roads because the project includes drainage improvements, such as culvert replacement and slope repair, to accommodate stormflows, filter runoff, and stabilize stream banks.

Environmental Hazards		
Goal EH-2	**Safety from Seismic and Geologic Hazards.** Protect people and property from risks associated with seismic activity and geologic conditions.	**Consistent.** As described in Section 4.5, Geology and Soils, the proposed project could be subject to geologic hazards, including seismic ground shaking, expansive or corrosive soils, and landslides. Implementation of the mitigation measures provided in this EIR would reduce potential impacts associated with geologic hazards. Implementation of these recommended mitigation measures will ensure project consistency with the County's seismic and geologic safety policy. .
Policy EH-2.3	**Ensure Seismic Safety of New Structures.** Design and construct all new buildings to be earthquake resistant. The minimum level of design necessary would be in accordance with seismic provisions and criteria contained in the most recent version of the State and County Codes. Construction would require effective oversight and enforcement to ensure adherence to the earthquake design criteria.	**Consistent.** Mitigation Measure GEO-1 requires that the Geotechnical Investigation's recommendations of construction techniques appropriate to minimize seismic damage shall be adopted as part of the project design and implementation plan. In addition, Marin County DPW shall review the Geotechnical Investigation along with final project plans to confirm that proposed improvements fully comply with the County of Marin Uniform Construction Standards and that the Geotechnical Investigation recommendations have been incorporated. Compliance with the recommended mitigation measures and the applicable constructions standards ensure project consistency with roadway seismic safety standards.
Program EH-2.a	**Require Geotechnical Reports.** Continue to require any applicant for land division, master plan, development approval, or new construction in a geologic hazard area to submit a geotechnical report prepared by a State-certified Engineering Geologist or a Registered Geotechnical Engineer that: evaluates soil, slope, and other geologic hazard conditions; commits to appropriate and comprehensive mitigation measures sufficient to reduce risks to acceptable levels, including post-construction site monitoring, if applicable; addresses the impact of the project on adjacent lands, and potential impacts of offsite conditions; and meets the requirements of other agency regulations with jurisdiction in the hazard area.	**Consistent.** As described in Section 4.5, Geology and Soils, the proposed project is consistent with this Program EH-2.a because a site-specific geotechnical investigation was conducted for the proposed project that explored and evaluated geologic and geotechnical soil conditions of the project area, including a field investigation and soil borings, in order to provide geotechnical conclusions and recommendations for the design of the pavement rehabilitation and stabilization.
Program EH-2.b	**Require Construction Observation and Certification.** Require any work or construction undertaken to correct slope instability or mitigate other geologic hazard conditions to be supervised and certified by a geotechnical engineer and/or an engineering geologist.	**Consistent**. The implementation of Mitigation Measure GEO-2 ensures that a qualified professional will observe soil conditions in the field during the rehabilitation process thereby making the project consistent with Program EH-2.b. Further, all design criteria and specifications made by the geotechnical consultant while monitoring the project shall be implemented to reduce impacts associated with problematic soils.
Program EH-2.f	**Avoid Known Landslides Areas.** Continue to prohibit development in landslide areas and on landslide-prone deposits on steep slopes, except where the required geotechnical report indicates that appropriate mitigation measures can stabilize the site for construction.	**Consistent.** As discussed in Section 4.5, Geology and Soils, the proposed project is located near steep slopes adjacent to Lagunitas Creek where slope failures and/or slope instability could occur. The proposed project is consistent with Program EH-2.f because the project would improve road conditions and repair/replace existing culverts so that discharge does not contribute to slope instability. The proposed project also includes slope repair in one area by replacing subsurface materials with engineered fill and constructing a down-slope retaining wall to stabilize the slope. Mitigation

		Measure GEO-3 requires a geotechnical investigation be prepared for the slope repair to ensure that proposed plans are appropriate. Implementation of this mitigation measure would reduce potential landslide impacts to a less than significant level.
Program EH-2.g	**Identify Compressible Soil Potential.** Require that geotechnical reports for projects on land underlain by compressible materials (such as fill, bay mud, and marsh or slough areas) delineate locations where settlement will be greatest and subsidence may occur, and recommend site preparation and construction techniques necessary to reduce risk and public liability to an acceptable level.	**Consistent.** Mitigation Measure GEO-2 requires that the designers and engineers of proposed improvements consider the site's potential to be underlain by soils with moderate to high shrink-swell potential a qualified professional observe soil conditions in the field during the rehabilitation process. If locations along the alignment of SFDB are underlain by expansive soils and/or non-engineered fill, the geotechnical consultant to the project shall determine if the soils encountered are problematic, and shall make recommendations to ensure potential damage related to expansive soils and non-uniformly compacted fills are minimized. All design criteria and specifications set forth in the Geotechnical Investigation and as made by the geotechnical consultant while monitoring the project shall be implemented to reduce impacts associated with problematic soils thereby ensuring project consistency with Program EH-2.g.
Program EH-2.m	**Implement Geological Assessment Ordinances.** Continue to implement ordinances requiring geological assessment (e.g., Preliminary Soils, Soils Investigation, and Geologic/Geotechnical reports) for new subdivisions and grading permits to identify the presence of surface fault rupture.	**Consistent.** As described in Section 4.5, Geology and Soils, a site-specific geotechnical investigation was conducted for the proposed project that explored and evaluated geologic and geotechnical soil conditions of the project area, including a field investigation and soil borings, in order to provide geotechnical conclusions and recommendations for the design of the pavement rehabilitation and stabilization. The proposed project is consistent with Program EH-2m.
Program EH-2.q	**Implement Subsidence Evaluation Guidelines.** Continue to implement ordinances that provide guidelines for subsidence evaluations of land that is or could be prone to subsidence. Require geological assessment (e.g., Preliminary Soils, Soils Investigation, and Geologic/Geotechnical reports) for new subdivisions and grading permits to identify hazards associated with subsidence and settlement.	**Consistent.** See above.
Program EH-2.r	**Implement Soil Classification and Design Guidelines.** Continue to implement ordinances that provide soil classification guidelines and design considerations for development in areas of expansive soils, as well as requiring geological assessment (e.g., Preliminary Soils, Soils Investigation, and Geologic/Geotechnical reports) for new subdivisions and grading permits to identify hazards associated with expansive soils.	**Consistent.** See above.
Goal EH-3	**Safety from Flooding and Inundation.** Protect people and property from risks associated with flooding and inundation. (Also see the Public Facilities and Water Resources sections.)	**Consistent.** The project is consistent with this goal because it would not place people or property at risk from flooding or inundation. The proposed project would rehabilitate the existing roadway. No residential or commercial uses would be built because of the proposed project. In addition, the proposed project would implement drainage improvements that include replacing currently undersized culverts and replacing them with properly

		sized culverts to convey the 100-year storm. The project also proposes drainage improvements where SFDB slopes toward the hillside and flooding occurs in the existing condition; flooding in these areas would be reduced by installing the project drainage improvement and water quality features (bioswales and sand filters), which would have positive drainage using subdrains and would reduce ponding of water.
Policy EH-3.2	**Retain Natural Conditions.** Ensure that flow capacity is maintained in stream channels and floodplains, and achieve flood control using biotechnical techniques instead of storm drains, culverts, riprap, and other forms of structural stabilization.	**Consistent.** As described in the preceding , the proposed project is consistent with this Policy EH-3.2 because drainage improvements included in the proposed project would incorporate biotechnical techniques such as bioswales and sand filters in addition to culverts and other stabilization techniques.
Policy EH-3.3	**Monitor Environmental Change.** Consider cumulative impacts to hydrological conditions, including alterations in drainage patterns and the potential for a rise in sea level, when processing development applications in watersheds with flooding or inundation potential.	**Consistent.** Section 6.0 of this EIR provides a discussion of the cumulative impacts of the proposed project. The proposed project, like some of the other planned projects in Marin County, would increase impervious surfaces. Construction activities and operation of the roadway also have the potential to degrade the quality of surface water and creeks in Marin County. The implementation of mitigation measures outlined in Section 4.6, Hydrology and Water Quality would reduce the project's hydrology and water quality impacts to a less-than-significant level. Other planned projects in the County would likely be required to implement similar measures. Therefore, the proposed project would not result in a significant cumulative hydrology or water quality impact.
Program EH-3.f	**Require Hydrologic Studies.** Continue to require submission of detailed hydrologic and geologic studies for any proposed development that could increase sedimentation of a watercourse or alter natural drainage patterns. Amend the Development Code to include findings to continue to regulate development in flood prone areas to ensure public health and safety and to preserve the hydraulic and geomorphic integrity of the stream system and associated habitat.	**Consistent.** As described in Section 4.6, Hydrology and Water Quality, implementation of the proposed project would not increase sedimentation or alter natural drainage patterns nor would it expose people or property to risks associated with flooding or inundation. A site-specific geotechnical investigation and a culvert analysis were conducted for the proposed project.
Atmosphere and Climate		
Goal AIR-1	**Improved Regional Air Quality.** Promote planning and programs that result in the reduction of airborne pollutants measured within the county and the Bay Area.	**Consistent.** Long-term operation of the roadway would not result in an increase in airborne pollutants within the county or the Bay Area. However, short-term degradation of local air quality may occur during construction due to the release of particulate emissions generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include carbon monoxide (CO), nitrogen oxides (NO_x), volatile organic compounds (VOCs), directly-emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants such as diesel exhaust particulate matter. Implementation of Mitigation Measure AIR-1 would reduce potential air quality impacts associated with project construction to a less than significant level thereby making the project consistent with this goal.

Policy AIR-1.3	**Require Mitigation of Air Quality Impacts.** Require projects that generate potentially significant levels of air pollutants, such as quarry, landfill operations, or large construction projects, to incorporate best available air quality mitigation in the project design.	**Consistent.** The project is consistent with this policy because the incorporation of EIR recommended air quality mitigation measures into the project will reduce potential air quality impacts associated with project construction.
Program AIR-1.b	**Evaluate Air Quality Impacts of Proposed Projects and Plans.** As part of the Environmental Review Process, use the current BAAQMD CEQA Guidelines to evaluate the significance of air quality impacts from projects or plans, and to establish appropriate minimum submittal and mitigation requirements necessary for project or plan approval.	**Consistent.** Section 4.9, Air Quality, in this EIR describes the potential air quality impacts that could result from implementation of the proposed project. Mitigation measures included in Section 4.9 would reduce potential air quality impacts associated with the proposed project to a less-than-significant level.
Program AIR-1.g	**Require Control Measures for Construction and Agricultural Activity.** Require reasonable and feasible measures to control particulate emissions (PM-10 and PM-2.5) at construction sites and during agricultural tilling activity, pursuant to the recommendations in the BAAQMD CEQA Guidelines, which may include the following: • Watering active construction or agricultural tilling areas. • Covering hauled materials. • Paving or watering vehicle access roads. • Sweeping paved and staging areas.	**Consistent.** Mitigation Measure AIR-1, included in this EIR (see Section 4.9, Air Quality) would reduce potential particulate emissions associated with project construction to a less than significant level.
Goal AIR-4	**Minimization of Contributions to Greenhouse Gases.** Prepare policies that promote efficient management and use of resources in order to minimize greenhouse gas emissions. Incorporate sea level rise and more extreme weather information into the planning process.	**Consistent.** Mitigation Measure GCC-1, included in this EIR (see Section 4.12, Global Climate Change), provides Best Management Practices recommended by the BAAQMD to reduce GHG emissions during project construction. Implementation of this mitigation measure would reduce impacts associated with greenhouse gas emissions during construction to a less than significant level.
Program AIR-4.b	**Reduce Greenhouse Gas Emissions Resulting from Transportation.** Increase clean-fuel use, promote transit-oriented development and alternative modes of transportation, and reduce travel demand. (Also see TR-4, AIR-3, DES-2, HS-2, HS-3, CD-2, CD-3, and EC-1.)	**Consistent.** The proposed project entails rehabilitation of an existing roadway to improve function and safety. Implementation of the proposed project would not accommodate additional traffic levels on Sir Francis Drake Boulevard, but would improve road conditions for existing traffic levels. Improved roadway conditions should promote vehicle performance and a marginal, but un-measurable, reduction in vehicle emissions.
Program AIR-4.j	**Acquire and Restore Natural Resource Systems.** Take and require all technically feasible measures to avoid or minimize potential impacts on existing natural resource systems that serve as carbon sinks. (Also see CD-1, BIO-2, BIO-3, BIO-4, BIO-5, OS-1, and OS-2.)	**Consistent.** The proposed project is consistent because it has been designed to minimize potential impacts to natural resources. However, some natural resource systems would be impacted (see Section 4.3, Biological Resources). Mitigation measures included in this EIR would reduce potential impacts to natural resources to a less than significant level.
Program AIR-5.f	**Protect and Enhance Native Habitats and Biodiversity.** Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout Marin. Require identification of sensitive biological resources and commitment to adequate protection and mitigation. (Also see BIO-1 and BIO-2.)	**Consistent.** The project as designed and with the incorporation of the mitigation measures in Section 4.3 Biological Resources will not result in significant impact on native habitat or biodiversity and is therefore consistent with Program AIR-5.f.
Trails		

Goal TR-1	**Trail Network Preservation and Expansion.** Preserve existing trail routes designated for public use on the Marin Countywide Trails Plan maps, and expand the public trail network for all user groups, where appropriate. Facilitate connections that can be used for safe routes to school and work.	**Consistent.** The proposed project would not affect existing trails near the project site. Implementation of the proposed project would result in a less hazardous roadway environment for bicyclists because the roadway would have a uniform smoother surface, increased paved width where appropriate, fewer vehicle turning movements due to the removal of unofficial turnouts and improved sight distance. The Marin County Unincorporated Area Bicycle and Pedestrian Master Plan identifies a Class III bike route along SFDB as part of the proposed bikeway network. The project would not inhibit completion of that plan.
Policy TR-1.1	**Protect the Existing Countywide Trail System.** Maintain the existing countywide trail system and protect the public's right to access it.	**Consistent.** See above.
Policy TR-1.2	**Expand the Countywide Trail System.** Acquire additional trails to complete the proposed countywide trail system, providing access to or between public lands and enhancing public trail use opportunities for all user groups, including multi-use trails, as appropriate.	**Consistent.** As described above, implementation of the proposed project would improve roadway conditions for vehicles, bicyclists, and pedestrians. The Marin County Unincorporated Area Bicycle and Pedestrian Master Plan identifies a Class III bike route along SFDB as part of the proposed bikeway network. The project does not inhibit the completion of that plan. A Class III bike route provides for shared use with pedestrian or motor vehicle traffic and is identified only by signing.
Agriculture and Food		
Goal AG-1	**Preservation of Agricultural Lands and Resources.** Protect agricultural land by maintaining parcels large enough to sustain agricultural production, on-agricultural uses, and prohibiting uses that are incompatible with long-term agricultural production. Preserve important soil, agricultural water sources, and forage to allow continued agricultural production on agricultural lands.	**Consistent.** The proposed project entails rehabilitating the existing roadway within the Marin County right-of-way. It would not affect adjacent agricultural lands.
Policy AG-1.9	**Continue Agricultural Uses on Federal Land.** Encourage continuation of agricultural operations and uses in the pastoral zones of the Point Reyes National Seashore and the Golden Gate National Recreation Area through long-term tenure agreements (leases) with agricultural operators.	**Consistent.** See above.
Community Development		
Goal CD-1	**Environmental Corridor Land Use Framework.** Establish, maintain, and continue to improve a broad land use management framework using the County's environmental corridors as a basis for local policies and regulation, and to maintain the character of each of the corridors.	**Consistent.** The proposed project is located in the Inland Rural Corridor. Implementation of the proposed project would rehabilitate an existing roadway to improve its longevity and safety. It would not conflict with the goals and policies designed to protect the character of the Inland Rural Corridor.
Policy CD-1.1	**Direct Land Uses to Appropriate Areas.** Concentrate urban development in the City-Centered Corridor, where infrastructure and facilities can be made available most efficiently. Protect sensitive lands in the Baylands Corridor. Emphasize agricultural uses in the Inland Rural Corridor, along with preservation of resources, habitat, and existing communities. Focus on open space, recreational, and agricultural land uses, as well as preservation	**Consistent.** The proposed project entails rehabilitating the existing roadway within the Marin County right-of-way. Additional traffic capacity would not be provided as a result of implementing the proposed project. The proposed project would not affect agricultural uses within the Inland Rural Corridor. Although the project has been designed to minimize environmental impacts, construction activities could affect natural resources and wildlife habitat.

	of existing communities in the Coastal Corridor.	However, incorporation of recommended mitigation measures in Section 4.3, Biological Resources, would ensure project consistency with the resource preservation provisions of Policy CD-1.1
Program CD-1.d	**Maintain Agriculture in the Inland Rural Corridor.** Work with individual landowners; special districts; local State, and federal agencies; and private groups to ensure that rural character is preserved, agricultural operations remain viable in the Inland Rural Corridor, and sensitive resources and existing communities are not threatened.	**Consistent.** The proposed project entails rehabilitating the existing roadway within the Marin County right-of-way. It would not affect the use of agricultural lands within the Inland Rural Corridor.
Policy CD-2.8	**Limit Development in Resource or Hazard Areas.** Discourage development in areas with high natural resource value or threats to life or property, and restrict development in such areas to minimize adverse impacts.	**Consistent.** The proposed project would rehabilitate an existing roadway within Marin County. SFDB traverses a high value natural resource area, but also provides a vital transportation connection between the urbanized eastern and rural western regions of the County. Proposed roadway improvements will not increase the vehicle capacity of the roadway, therefore the project will not promote new development in localities served by the roadway.
Policy CD-4.3	**Participate with Regional, State, and Federal Agencies.** Coordinate with nearby counties, and with State and federal agencies, regarding regional land use and transportation planning.	**Consistent.** In compliance with CEQA, Responsible and Trustee Agencies, including the National Park Service, California Department of Parks and Recreation, California Department of Fish and Game and others were sent a Notice of Preparation and will have the opportunity to review and comment on this EIR during the public review period.
Program CD-4.d	**Coordinate with State and Federal Authorities.** Coordinate with the National Park Service, the State Department of Parks and Recreation, and other appropriate agencies during review of development proposed for property within or adjacent to State or federal lands within and adjacent to Marin County.	**Consistent.** See above.
Policy CD-8.5	**Establish Agricultural Land Use Categories.** Agriculture land use categories are established to preserve and protect a variety of agricultural uses, and to enable the potential for agricultural production and diversification. Historically, 60 acres has been the minimum parcel size for most agricultural lands in the county. Various policies regarding agricultural productivity, water availability, effects on water quality, and other factors govern the subdivision of such lands, along with the intensities described below. The effect is that subdivisions of agricultural lands are rare. The following Agricultural land use categories are established: Agriculture 1. This land use category is established for agricultural uses, including nonresidential structures necessary for agricultural operations at a floor area ratio (FAR) of .01 to .091, and housing with a density of one dwelling unit per 31 to 60 acres. Agriculture 2. This land use category is established for agricultural uses, including nonresidential structures necessary for agricultural operations at	**Consistent.** The proposed project entails rehabilitating the existing roadway within an existing right-of-way. It would not affect adjacent agricultural lands.

	a floor area ratio (FAR) of .01 to .091, and housing with a density of one dwelling unit per 10 to 30 acres. Agriculture 3. This land use category shall be provided for agricultural uses, including nonresidential structures necessary for agricultural operations at an FAR of .01 to .091, and housing with a density of one dwelling unit per 1 to 9 acres.	
Policy CD-8.9	**Establish Public Facility, Quasi-Public Facility, and Open Space Land Use Categories.** Lands used for public facilities and quasi-public institutional purposes, including airports, schools, hospitals, cemeteries, government facilities, correctional facilities, power distribution facilities, sanitary landfills, and water facilities, are designated Public Facility or Quasi-Public Facility, depending on the nature of their use. The Public Facility category is established for land owned by a governmental agency and used as a public institution. The Quasi-Public Facility category is provided for land owned by a nongovernmental agency that is used as an institution serving the public. A Public Facility or Quasi-Public Facility designation may be combined with another land use designation. In such instances, the applicable standard of building intensity is that for Public or Quasi-Public Facility, as depicted on the Land Use Policy Maps. Lands in public ownership for open space purposes, such as recreation, watershed, and habitat protection and management, are designated Open Space. In addition, private lands may be designated Open Space when subject to deed restrictions or other agreements limiting them to open space and compatible uses. Lands designated Open Space are subject to an FAR of .01 to .09. The following categories shall be established for public and quasi-public land use. The zoning designations listed are examples of consistent zoning and are not the only possible consistent zoning designations. <u>Public</u> Consistent zoning: PF PF-RSP-.05 to PF-RSP-7 PF-RMP-.01 to PF-RMP-16 PF-ARP-20 C-PF-ARP-20 <u>Quasi-Public</u> Consistent zoning: RMP-.1 RA:B-1 <u>Open Space</u> Consistent zoning: OA	**<u>Consistent.</u>** The proposed project entails rehabilitating the existing roadway within an existing right-of-way. It would not affect adjacent open space land uses.

Community Design		
Goal DES-1	**Preservation of Community Character.** Perpetuate the unique character of each community, including the essential design characteristics that make it attractive and livable.	**Consistent.** As described in Section 4.2, Aesthetics, most aspects of the proposed project including repaving the roadway, replacing culverts, slope repair, and closing a series of pullouts would not significantly affect the visual character or scenic quality of the roadway and its surroundings. The tree removal associated with widening the roadway under Option A would change the visual experience for those familiar with traveling the roadway but would not alter the visual character of the roadway or the project area. The removal of 9 additional trees under Option A does not further the goal of preserving community character yet the visual context for the observer, including preservation of scenic quality and views of the nature will be maintained. Accordingly, the removal of up to 17 trees, given the number of trees (thousands) remaining in the project area, will not change the visual character of the project area and is consistent with Goal DES-1.
Policy DES-1.2	**Protect Rural Character.** Ensure that development in rural areas is consistent with local design and scale and does not detract from the open character of the landscape.	**Consistent.** See above.
Goal DES-4	**Protection of Scenic Resources.** Minimize visual impacts of development and preserve vistas of important natural features.	**Consistent** See above.
Policy DES-4.1	**Preserve Visual Quality.** Protect scenic quality and views of the natural environment — including ridgelines and upland greenbelts, hillsides, water, and trees — from adverse impacts related to development.	**Consistent.** See above.
Transportation		
Goal TR-1	**Safe and Efficient Movement of People and Goods.** Provide a range of transportation options that meet the needs of residents, businesses, and travelers.	**Consistent.** The proposed project would rehabilitate the existing roadway to improve its longevity and enhance safety and is consistent with Goal TR-1.
Policy TR-1.6	**Keep Rural Character in West Marin.** Maintain roads in West Marin as two-lane routes, with the possible additions of bicycle lanes, turn lanes at intersections, and turnouts for slow-moving traffic.	**Consistent.** The proposed project entails rehabilitating the existing two-lane roadway to improve longevity and safety. No additional lanes would be created as a result of the proposed project. The project is consistent because it will maintain the existing rural character of the roadway.
Program TR-1.o	**Keep West Marin Rural.** Limit West Marin roads to two lanes, and work with State and federal agencies and local communities to enhance road safety, improve pedestrian, bicycle, and transit access, and maintain or reduce congestion through means such as limiting local parking, creating a multipurpose path from West Marin to the City-Centered Corridor, and providing shuttle service to popular destinations. Shoulder widening for bicycles, turn lanes at intersections, turnouts for slow-moving traffic, traffic calming measures, and similar improvements would be permitted. However, projects will not be undertaken to increase the motorized vehicle capacity of West Marin roads.	**Consistent.** The proposed project entails rehabilitating the existing two-lane roadway. No additional capacity would be provided with implementation of the proposed project. A series of pullouts would be closed as part of the proposed project, thereby limiting future parking along the roadway. Proposed roadway improvements would result in a less hazardous environment for use by vehicles, pedestrians, and bicyclists because the roadway would have a uniform smoother surface, increased paved width where appropriate, fewer vehicle turning movements due to the removal of unofficial turnouts and improved vehicle, pedestrian and bicyclist sight distance.
Goal TR-2	**Increased Bicycle and Pedestrian Access.** Expand bicycle and pedestrian	**Consistent.** As previously discussed, implementation of the proposed

	facilities and access in and between neighborhoods, employment centers, shopping areas, schools, and recreational sites (see Maps 3-9a, 3-9b, and 3-9c, Bikeways of Marin County).	project would improve conditions for bicyclists and pedestrians using SFDB. The Marin County Unincorporated Area Bicycle and Pedestrian Master Plan identifies a Class III bike route along SFDB as part of the proposed bikeway network. The project does not inhibit the completion of that plan.
Policy TR-2.1	**Improve the Bicycle and Pedestrian Network.** Promote adequate bicycle and pedestrian links, to the extent feasible, throughout the county, including streetscape improvements and standards that are safe and pedestrian and bicycle friendly.	**Consistent.** As previously discussed, implementation of the proposed project would improve conditions for bicyclists and pedestrians using SFDB. The proposed roadway improvements in conjunction with nearby pedestrian and bicycle trails promote access to the park lands and link the park lands with communities in west and east Marin County.
Policy TR-2.g	**Add Bicycle Lanes.** Identify roads with shoulders wide enough to be designated as bicycle lanes, and, where feasible, stripe and sign appropriate roadway segments as bike lanes and bike routes.	**Consistent.** SFD Blvd through the project area does not have existing shoulders wide enough to be designated as bicycle lanes. .
Goal TR-4	**Protection of Environmental Resources.** Minimize environmental disruption and energy use related to transportation.	**Consistent.** The proposed project would occur entirely within the existing right-of-way; no additional land would be condemned to complete the proposed project. The project has been designed to minimize environmental impacts associated with roadway construction. Construction activities could affect aesthetic, biological, cultural, and water resources. Mitigation measures provided in this EIR would reduce these impacts to a less than significant level.
Policy TR-4.1	**Minimize Disturbance and Condemnation.** Limit environmental disruption and condemnation of land due to transportation projects.	**Consistent.** See above.
Policy TR-4.2	**Recycle and Conserve Energy.** Include recycled and energy-conserving materials for road construction and repair, where feasible.	**Consistent.** As described in Chapter 3.0, Project Description, the proposed project would include pavement rehabilitation using rubberized asphalt concrete (RAC). RAC is a road material made of recycled tires that provides a longer design life than conventional asphalt. The uppermost layer of paving would consist of a permeable friction course (PFC), which is a layer of porous asphalt that reduces water runoff, improves traction, and limits roadway noise.
Program TR-4.a	**Limit Project Impacts.** Work with Caltrans and private transportation contractors to minimize environmental damage and storm water runoff through best management practices, and to avoid condemnation of private or publicly owned land in conjunction with transportation improvement projects.	**Consistent.** The proposed project would implement Best Management Practices to reduce storm water runoff and other water quality impacts associated with project construction. See Section 4.3, Biological Resources and Section 4.6 Hydrology and Water Quality.
Program TR-4.b	**Use Recycled and Resource Efficient Materials.** Use resource efficient materials, such as rubberized asphalt concrete and pervious pavement, in road repair and construction wherever cost effective and feasible.	**Consistent.** As described in Chapter 3.0, Project Description, the proposed project would include pavement rehabilitation using rubberized asphalt concrete (RAC).
Noise		
Goal NO-1	**Protection from Excessive Noise.** Ensure that new land uses, transportation activities, and construction do not create noise levels that impair human health or quality of life.	**Consistent.** As described in Section 4.10, Noise, the proposed project would not increase existing roadway noise levels in the project area. The proposed roadway improvements combined with the use of rubberized asphalt will

		reduce the noise levels now generated by vehicles passing over a deteriorated roadway surface. Although construction noise would result in a temporary or periodic increase in ambient noise levels in the project area above the existing ambient noise level, the long term ambient noise level after project construction will be incrementally lower. Implementation of Mitigation Measure NOI-1, identified in this EIR, would reduce potential construction noise impacts to less-than-significant levels.
Policy NO-1.2	**Minimize Transportation Noise.** Ensure that transportation activities do not generate noise beyond acceptable levels, including in open space, wilderness, wildlife habitat, and wetland areas.	**Consistent.** Implementation of the proposed project is not expected to increase traffic on Sir Francis Drake Boulevard; therefore, the project would not increase permanent noise levels at sensitive receptors in the project vicinity. Additionally, the proposed project would replace the existing asphalt concrete with rubberized asphalt concrete (RAC). RAC is a road material made of recycled tires that has been successfully used in California since the 1970's. RAC results in the benefit of reduced vehicle noise on roadways paved with RAC.
Policy NO-1.3	**Regulate Noise Generating Activities.** Require measures to minimize noise exposure to neighboring properties, open space, and wildlife habitat from construction-related activities, yard maintenance equipment, and other noise sources, such as amplified music.	**Consistent.** Implementation of Mitigation Measure NOI-1will limit construction activities to the less-noise sensitive periods of the day and requires other measures to minimize noise impacts associated with construction activities (i.e., mufflers for construction equipment, informational signage).
Program NO-1.i	**Regulate Noise Sources.** Sections 6.70.030(5) and 6.70.040 of the Marin County Code establish allowable hours of operation for construction-related activities. As a condition of permit approval for projects generating significant construction noise impacts during the construction phase, construction management for any project shall develop a construction noise reduction plan and designate a disturbance coordinator at the construction site to implement the provisions of the plan.	**Consistent.** In accordance with the Marin County Code, Mitigation Measure NOI-1, included in this EIR, limits the hours of construction and requires that a "disturbance coordinator" be designated to respond to any local complaints about construction noise.
Public Facilities and Services		
Policy PFS-3.3	**Reduce Storm Water Volume.** Implement appropriate upstream water-saving technologies to reduce storm water volumes and increase percolation. Increase permeable surfaces and encourage on-site percolation to reduce storm water volume and potential overflow of wastewater treatment facilities.	**Consistent.** The proposed project would not create or contribute runoff that would exceed the capacity of existing or planned stormwater drainage systems. As discussed in Section 4.6, as a result of the increased impervious surface, the runoff volume generated from the 2-year, 24-hour storm would increase from 331,000 cubic feet in the existing condition to 333,500 cubic feet for the project (an increase in 2,500 cubic feet). Option A would include an additional 8,540 square feet of paved area. Implementation f Mitigation Measure HYD-1, which requires preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) during project construction and inclusion of water quality protection measures as part of the project design, would reduce potential impacts associated with stormwater runoff to a less-than-significant level.
Public Safety		
Goal PS-4	**Decreased Exposure to Hazardous Materials.** Reduce the risks to human	**Consistent.** The proposed project does not involve the routine use, transport,

	and environmental health from hazardous materials.	or storage of hazardous materials. However, hazardous materials would be used at the project site during project construction and ground disturbing activities associate with project construction could result in the release of hazardous materials. Implementation of the mitigation measures included in this EIR, which require the preparation and implementation of a Health and Safety Plan and a Risk Management Plan (HSPRMP), would reduce potential impacts related to hazardous and the risk of human, animal, and environmental exposure.
Policy PS-4.1	**Regulate and Reduce Hazardous Material Use.** Control the use and storage of hazardous materials to minimize their presence in, and potential dangers to, the community and environment.	**Consistent.** As described above, project construction could result in the release of hazardous materials. Implementation of the mitigation measures included in this EIR would ensure that construction materials are stored away form sensitive resources including Lagunitas Creek. The preparation and implementation of a HSPRMP will be the mechanism the community and environment are protected from the affects of hazardous materials.
Program PS-4.d	**Prepare for Hazardous Materials Incidents.** Plan for response to an emergency involving a major release of hazardous materials (see Policy PS-3.1; also see the Environmental Justice Section of the Socioeconomic Element).	**Consistent.** Mitigation Measure HAZ-1 requires the preparation and implementation of a HSPRMP to address the possibility of encountering unknown contamination or subsurface hazards, in addition to emergency response procedures in the event of a hazardous materials release.
Community Participation		
Goal CP-1	**Broad and Diverse Participation.** Incorporate all segments of the community in County planning efforts and local decision making.	**Consistent.** The County published a Notice of Preparation and held a public scoping meeting to receive input from the community on environmental concerns prior to preparing the draft EIR. In accordance with the CEQA Guidelines, this draft EIR will be distributed for a 45-day public review period to allow all those interested in the proposed project to comment on its potential environmental impacts.
Historical and Archaeological Resources		
Goal HAR-1	**Historical Resource Protection.** Identify and protect archaeological and historical resources as major contributors to quality of life and community vitality in Marin.	**Consistent.** Ground disturbing activities associated with project construction could impact archaeological and historical resources within the project area. Implementation of Mitigation Measure CULT-1 and CULT-2, described in this EIR, will ensure that archaeological and historical resources are protected.
Policy HAR-1.1	**Preserve Historical Resources.** Identify archaeological and historical resource sites.	**Consistent.** As described in Section 4.4, Cultural Resources, historical and archaeological resources have been identified within and adjacent to the project site and may be impacted by project construction. Implementation of the mitigation measures identified in this EIR will protect archaeological and historical resources should they be encountered during project construction.
Policy HAR-1.3	**Avoid Impacts to Historical Resources.** Ensure that human activity avoids damaging cultural resources.	**Consistent.** As described in Section 4.4, Cultural Resources, historical and archaeological resources have been identified within and adjacent to the project site and may be impacted by project construction. Implementation of the mitigation measures identified in this EIR would avoid impacts to

		historic resources.
Program HAR-1.d	**Require Archaeological Surveys for New Development.** Require archaeological surveys conducted on site by a State-qualified and FIGR recommended archaeologist for new development proposed in areas identified as potential resource locations on the County sensitivity map (see Program HAR-1.a).	**Consistent.** As described in Section 4.4, Cultural Resources, Pacific Legacy conducted an archaeological survey of the project site. The results of this survey have been detailed in this EIR.
Program HAR-1.e	**Require Permanent Protection**. Require development at an archaeological site to, where feasible, avoid the resource and provide permanently deeded open space that incorporates the resource.	**Consistent.** Mitigation Measure CULT-1 included in this EIR, requires Environmentally Sensitive Areas be established, avoided, and monitored during project construction. In addition, any resource that would be affected by project activities shall be evaluated to determine if the deposit qualifies as a historical or archaeological resource under CEQA. If the deposit *does* so qualify, then the County shall develop and implement, in consultation with the project archaeologist, a plan to mitigate the impact.
Program HAR-1.f	**Involve Appropriate Authorities**. Refer development proposals on or near cultural resource sites to the California Archaeological Inventory, the Northwest Regional Office of the California Historical Resources Information System, and/or Native American representatives, as appropriate.	**Consistent.** As part of preparing this EIR, a records search of the project area was conducted by the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) for Pacific Legacy and Synthesis Planning on October 2, 2007 (NWIC File No. 07-0489), and updated by the NWIC on August 21, 2009 (NWIC File No. 09-0183). A search of the Sacred Lands Inventory maintained by the Native American Heritage Commission (NAHC) was also requested for the project area. (See Section 4.4, Cultural Resources). In addition, the County engineer in charge of the project met with a representative of the Federated Indians of Graton Rancheria (FIGR) to listen to their concerns and expand the environmental analysis to address the concerns of the FIGR.

Source: LSA Associates, Inc. 2009

Marin County Unincorporated Area Bicycle and Pedestrian Master Plan. The Marin County Unincorporated Area Bicycle and Pedestrian Master Plan (Master Plan) includes recommendations to create an integrated, complete network of bicycle paths, lanes, routes and pedestrian improvements in Marin County. The goal of the Master Plan is to increase the number of people walking or bicycling for utilitarian trips, such as for work, school, shopping or recreation. The Master Plan identifies both short- and long-term projects such as new bikeways or walkways as well as education, outreach and other programs.

The Master Plan identifies two proposed improvements in the project area: the Rural Roads Improvement Project and the Samuel P. Taylor Bike Path/East-West Bikeway Project. The Rural Roads Improvement Project calls for implementing a combination of the following improvements along Marin County's rural roads: sign installation, shoulder widening, re-striping, new or improved turnouts, and enhanced roadway maintenance. SFDB between Lagunitas and Shoreline Highway is identified as an area for improvements; the project site lies within this improvement area.

The Samuel P. Taylor Bike Path/East-West Bikeway Project proposes to improve the Northwestern Pacific (NWP) narrow gauge railroad line to provide a continuous multi-use path between Woodacre and Pt. Reyes Station. Part of this bikeway has already been constructed. Proposed improvements include: installation of hard surface on the existing soft-surface path; improvement of the existing paved path through Samuel P. Taylor Park to Tocaloma; extension of the trail from Tocaloma to Point Reyes Station, and development of a pathway or bicycle lanes to connect Point Reyes Station to Inverness Park.

Point Reyes National Seashore and Golden Gate National Recreation Area General Management Plan. The General Management Plan is a guide for the responsible management of the natural and cultural resources of the Point Reyes National Seashore and Golden Gate National Recreation Area and represents a commitment by the National Park Service "to share in the responsibility for improving the quality of urban living in the Bay Area." Relevant management objectives include:

- To maintain and restore the character of natural environment lands by maintaining the diversity of native park plant and animal life, identifying and protecting threatened and endangered plant and animal species, marine mammals, and other sensitive natural resources, controlling exotic plants, and checking erosion whenever feasible.
- To maintain the primitive and pastoral character of the parklands in northern Marin County by providing only minimum dispersed development. Necessary concentrated developments will be confined to the southern Marin County and San Francisco portions of the recreation area.
- To recognize the importance of the cultural resources within the recreation area through a positive program of their identification, evaluation, preservation, management and interpretation.

The project area appears to fall within two management zones as defined in the General Management Plan: the Pastoral Landscape Management Zone and the Natural Landscape Management Zone. These two management zones are described as follows:

- *Pastoral Landscape Management Zone (northern Olema Valley and northern Point Reyes peninsula):* This zone includes lands within which it has been determined that dairying and cattle ranching are desirable from both an educational and aesthetic point of view. At a minimum,

agricultural buildings and open grasslands will be retained in these areas, and where feasible, livestock grazing will continue within the limits of carefully monitored range capacities. Additional resource management studies may significantly alter the configuration of this zone as it now appears in GGNRA. Also included in this zone is a heather and flower farming operation near Muir Beach, which is considered to be a desirable aspect of the local agricultural economy.

- *Natural Landscape Management Zone (Marin Headlands, Stinson Beach area, southern Olema Valley, and a few areas in Point Reyes):* In this zone natural resources and processes will remain as undisturbed as possible given a relatively high level of natural park uses (hiking, primitive camping, etc.). Management activities will be directed primarily at protecting wildlife and vegetation from misuse and overuse and at maintaining a variety of landscape settings conducive to recreation (open grasslands as well as forests).

The National Park Service is presently in the process of updating the General Management Plan. It is preparing a Draft General Management Plan and its associated Environmental Impact Statement and expects to publish the documents in 2010.[18]

San Geronimo Valley Salmon Enhancement Plan (SGVSEP). This February 2010 plan was prepared for the Marin County Department of Public Works as an advisory document to inform landowners and public agencies on how to improve and maintain habitat conditions to support viable populations of salmonids in San Geronimo Valley, which lies in the Lagunitas Creek watershed immediately upstream of the proposed project site. It contains various recommendations for best management practices and land uses to help implement four basic core strategies, as follows: (1) preservation and improvement of habitat conditions for all salmonid life stages; (2) promotion of ecosystem resiliency through rehabilitating natural processes; (3) correcting and avoiding activities that degrade habitat wherever possible; and (4) sustainment of the character and quality of life in San Geronimo Valley.

The SGSVEP does not have any regulatory authority; nor does it directly apply to the Lagunitas Creek watershed downstream of the San Geronimo Valley. Nevertheless, the SGVSEP contains many recommendations for protecting salmonid habitat that should reasonably be used throughout the entire Lagunitas Creek watershed, given the presence of the same habitat and salmonid populations. The SGSVEP and its recommendations are discussed more fully in Section 4.3, Biological Resources.

4.1.3 Significance Criteria

Appendix G of the *CEQA Guidelines* provides that a project may have a significant impact on land use if it would:

- Physically divide an established community.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

[18] National Park Service, 2009. Point Reyes National Seashore and Golden Gate National Recreation Area General Management Plan, Newsletter 5, Summer 2009, website, http://parkplanning.nps.gov/projectHome.cfm?parkID=303&projectId=15075

- Conflict with any applicable habitat conservation plan or natural community conservation plan.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant impact related to land use if it would:

- Call for land uses that would convert prime agricultural land to non-agricultural use or impair the productivity of prime agricultural land.
- Conflict with County land use goals or policies.
- Call for land uses that would conflict with existing or proposed uses at the periphery of the project area or with other local land use plans.
- Result in conversion of open space into urban or suburban scale development.
- Conflict with local zoning.
- Result in nuisance impacts as a result of incompatible land uses.

4.1.4 Impacts and Mitigation Measures

The following discussion analyzes impacts related to land use that could result from project implementation. All impacts would be less than significant.

(1) Divide an Established Community. The physical division of an established community typically refers to the construction of a physical feature (such as an interstate highway or railroad tracks) or removal of a means of access (such as a local road or bridge) that would impair mobility with an existing community, or between a community and outlying areas. The proposed project would not create a barrier that would divide an established community; it would enhance the safety and stability of the existing roadway and improve vehicular access between Lagunitas and Point Reyes Station. As such, the project would not physically divide an established community.

(2) Conflict with Applicable Plans, Policies and Regulations. The proposed project is consistent with the Marin Countywide Plan and other applicable planning documents. The policies contained in these regulatory documents seek to enhance the transportation network while preserving open space, visual resources, quality of life, and the environment. The proposed project implements a number of goals within the plans including: safety improvements that benefit bicyclists and pedestrians, ensures the safe and efficient movement of the people and goods, minimizes impacts on the rural nature of the community, and preserves existing land uses. The proposed project involves the rehabilitation of an existing roadway to improve safety and increase the longevity of the existing infrastructure. No additional capacity to accommodate increased traffic would be provided. Implementation of Option A would widen the roadway further to provide additional paved width and improved sight distance in accordance with the goals and policies of the Marin Countywide Plan.

The proposed project could impact visual resources, cultural resources, biological resources, and water resources in conflict with the planning goals and policies included in the Natural Resources and Agriculture Element of the Marin Countywide Plan. Impacts to these resources are not land use impacts by nature and are discussed in other sections of this document. County planning documents call for the mitigation of environmental impacts. As discussed in other sections of this document, all

of the impacts associated with the proposed project can be mitigated by implementing the measures described in this EIR.

(3) Conflict with a Habitat Conservation Plan or Natural Community Conservation Plan. The project site is not subject to the provisions of a Habitat Conservation Plan or Natural Community Conservation Plan (HCP/NCCP). Therefore, the project would not conflict with such a plan.

(4) Convert Agricultural Land. Although some agricultural land is located in the vicinity of the project site, the proposed project is the rehabilitation of an existing road within an established right-of-way. Roadway improvements would be limited to the area within the right-of-way and would not affect the use of existing agricultural land or result in the conversion of agricultural land to other uses.

(5) Conflict with Surrounding Land Uses. The proposed project would enhance the safety and stability of the existing two-lane roadway and improve vehicular access between Lagunitas and Point Reyes Station. It would not change the capacity or character of the road in a manner that would be incompatible with the surrounding land use, which as shown in Figure 4.1-1 is primarily open space, including the recreational lands of Samuel P. Taylor State Park, and some agriculture. Impacts to the natural resources around the project site, including Lagunitas Creek, are addressed in Section 4.3, Biological Resources.

(6) Convert Open Space. As described above, the proposed project is surrounded by public open space, including Samuel P. Taylor State Park and the GGNRA. Project activities would rehabilitate and make improvements to the existing roadway within the County right-of-way and would not convert adjacent public open space lands to other uses.

(7) Conflict with Local Zoning. The roadway rehabilitation project would not change the zoning of the project site or the surrounding area and therefore would not create a zoning conflict.

(8) Create Nuisance Impacts. The project would not create new land uses that would result in nuisance impacts; it would rehabilitate a two-lane section of SFDB to enhance the safety and stability of the existing roadway. During construction activities, disruption of traffic flows and other temporary effects on adjoining land uses, including noise impacts, air impacts, and lane closures could occur. These impacts are discussed within the appropriate topical sections of this document.

4.2 AESTHETICS

This section assesses the effects of the proposed project on the aesthetic and visual resources of the project area, including the visual impact of proposed roadway improvements on the existing visual character of the setting traversed by Sir Francis Drake Boulevard. The analysis also discusses the consistency of proposed project improvements with applicable visual resource related policies found in the November 2007 Marin CWP. Photos of the project area are included to illustrate the visual qualities of the project area.

The aesthetic analysis is based on: (1) information obtained during field investigations that were conducted in September, October and November, 2009; (2) a review of data provided by the project engineer including photographs and site plans; and (3) and planning documents related to the project area including the 2007 Marin CWP.

4.2.1 Setting

The evaluation of existing conditions for aesthetic resources requires the application of a process that objectively identifies the visual features, or resources of a landscape, assesses the character and quality of those resources relative to the overall visual character of the region and describes the perspective of people to the visual resource landscape.

Visual Characteristics of West Marin. The West Marin Planning Area consists of open space and agricultural lands with small villages (Forest Knolls, Lagunitas, San Geronimo, and Woodacre) located west of the more developed areas of San Rafael, San Anselmo and Fairfax. Land use policies outlined in the Marin Countywide Plan outline strategies to maintain these village boundaries in large part by relying on natural features defined by watershed boundaries and natural barriers (terrain, creeks, and open space).

SFDB provides the major east-west corridor through the West Marin Planning Area. The roadway travels generally northwest from Highway 101 to San Geronimo where it then turns north beginning at the Shafter Bridge until it connects to Highway 1 at Olema. This section of SFDB provides a transition, connecting the developed areas of Marin County to the agricultural lands and undeveloped open space and recreation areas of the coastline. Overall, the dominant visual character of the project area is undeveloped open space, a seemingly undisturbed landscape with the exception of the roadway, State Park facilities and the few homes located near Jewel.

The visual and aesthetic character of Sir Francis Drake Boulevard from Shafter Bridge in the east to the community of Olema in the west changes with the terrain and vegetation communities through which the roadway traverses. Likewise the visual experience of an observer is dependent upon the mode of transportation (vehicle, bicycle or pedestrian) and the speed with which the roadway is traversed. Overall there appears to be three major visual experiences an observer encounters along the roadway regardless of the mode of transportation.

- *Dense Woodland Forest:* Traveling along the roadway from east to west the observer first encounters a very dense woodland setting. The narrow width and curving alignment of the roadway combined with the dense trees, the dense tree canopy, and understory vegetation gives the traveler the experience of moving through a forest adjacent to a stream. The traveler does not

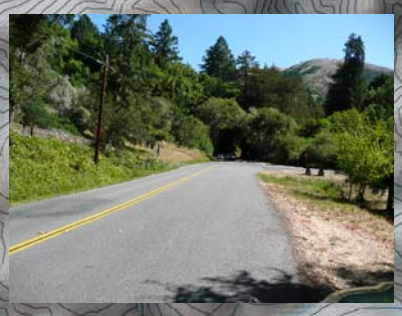
have to leave the roadway to experience the woodland forest. Even at Irving Bridge the experience is one of crossing a stream within the forest. The terrain and natural resources which combine to create this visual experience include: (1) the hilly topography, (2) Lagunitas Creek and its riparian environs, and (3) the mixed evergreen forest with its scattered groves of redwood trees.

- *Mixed Woodland and Grassland:* The visual experience of the traveling observer changes near the entrance to the Madrone Campground. Although the terrain is still hilly the vegetation community has changed. North of the road the visual experience is characterized by a mixture of grassland and scattered mixed coast live oak woodland. At first the grassland appears to be within a woodland setting, but soon the grassland community is more dominant and the woodlands appear to be scattered in clumps within a much broader grassland community. The visual experience south of the road is quite different. Here Lagunitas Creek and its environs convey a dense forest setting. The change in vegetation community also results in a change in the travelers perception. The observer traveling along SFDB now has the perception of traveling at the edge of the woodland forest to the south and through a mixed grassland/woodland terrain to the north.
- *Open Grassland:* As the traveling observer approaches Bolinas Ridge west of the Tocaloma Bridge (MM-20.56) the vegetation community on either side of the roadway changes to an expanse of open grassland in all directions. Here the observer has a generally unobstructed view from the roadway to the north and south and west to the Point Reyes National Seashore. Photographs that depict the viewing experience along the roadway are shown in Figure 4.2-1.

Topography. SFDB follows Lagunitas Creek through Samuel P. Taylor State Park and a portion of the GGNRA. The topography and vegetation delineate the primary visual components of the project site. The comparatively level and open surface of the roadway contrasts with the steep and heavily wooded slopes above the roadway and down slope to the creek. West of Shafter Bridge vertical rock cuts occur along the upslope edge of the roadway with steep slopes on the opposite side of the roadway descending to the creek. Riparian vegetation, redwood forest and steep topography visually define the project area and dominate views. The steep slopes combined with the redwood forest surround and enclose the roadway. Figure 4.2-1 illustrates the topography for this section of SFDB. The "enclosure" of the roadway by the surrounding terrain and vegetation and the curving alignment constrain views within the project area, restrict more distant long-range views, and limit the visible landscape to that occurring on either side of the roadway or a short distance ahead.

Natural Features. Natural features dominate the visual landscape along the roadway. The project area, supports eight native vegetative communities: stream/riparian, annual grassland, oak woodland, coastal scrub, mixed evergreen forest, redwood forest, seasonal wetland located in roadside swales and ditches, and ruderal disturbed. Lagunitas Creek, Barnabe Creek and a number of other named and unnamed streams comprise the stream/riparian vegetative community. The annual grassland vegetative community occurs primarily within the western one-third of the project site on the north side of SFDB. Coastal oak woodland is associated with annual grassland areas within the western one-third of the project site on the north side of SFDB. The coastal scrub vegetative community occurs on the north side of SFDB within the portions of the central section of the project site. The mixed evergreen forest community occurs within the project study area intermixed in upland areas with annual grassland and intergrades with the redwood and riparian vegetative communities. The redwood vegetative community occurs primarily along SFDB within the eastern half of the project

Platform Bridge



Olema

Samuel P. Taylor
State Park Sign
Eastbound

Overhead
Pedestrian
Bridge

Lagunitas

Samuel P. Taylor
State Park Sign
Westbound

Shafter Bridge

LSA

FIGURE 4.2-1

Sir Francis Drake Roadway Improvements Project

Topography

N

0 500 1,000 2,000
FEET

SOURCE: County of Marin.

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area and is also found in scattered areas within the western half of the project site, although at a much lower density of growth. The ruderal/disturbed vegetative community occurs in portions of the study areas with disturbed soils and on other areas of existing or past human disturbances, primarily occurring along the shoulders of SFDB.

Existing Structures. Few structures are visible from the roadway within the project site. Visible structures include a few signs, a bridge over-crossing and scattered buildings on the western edge of the roadway before Platform Bridge Road.

Light and Glare Conditions. The nighttime light environment within the project area is dominated by natural conditions with the exception of headlights from passing vehicles. No artificial lighting is provided along SFDB within the project area. The only source of daytime glare in the project are vehicles traveling on the roadway.

Roadway Views. Views from the roadway consist primarily of undeveloped open space, watershed, and wildlife habitat. Views of the natural landscape from the roadway are constrained by the steep, heavily forested conditions in the project area. Recreational activities associated with Samuel P. Taylor State Park: picnic and camping grounds, visitor parking and ranger kiosks, and some hiking and biking trails are viewed from the roadway. Visible portions of the McIsaac Ranch, located at the western end of the project area along the north side of SFDB are used for cattle ranching. A small number of existing residences at the west end of the project area on the creek side are visible from the roadway.

Views of the project area are experienced by those who travel along the roadway. The majority of views are from moving vehicles and bicyclists. Pedestrians who might have more time to view the roadway are not easily accommodated along the roadway due to the narrow paved width of the road and topographic conditions that for the most part prohibit continuous pedestrian movement adjacent to the roadway within the project area. Trees, vegetation, varied topography and the curvilinear alignment of SFDB limit and focus views to either side of the roadway and a short distance ahead.

4.2.2 Regulatory Framework

Policies relevant to the visual resources of the project area contained in the Marin CWP, the County Code, and the California State Scenic Highway Program.

Marin Countywide Plan. The Marin Countywide Plan serves as the comprehensive guide for making decisions about road improvements, protection of natural resources, and public health and safety. Policies throughout the Marin Countywide Plan emphasize the value of retaining the rural undeveloped character of West Marin. Policies relevant to the visual character or aesthetics of the proposed project include:

Goal BIO-1: Enhanced Native Habitat and Biodiversity. Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout the County.

Policy BIO-1.1: Protect Wetlands, Habitat for Special-Status Species, Sensitive Natural Communities, and Important Wildlife Nursery Areas and Movement Corridors. Protect sensitive biological resources, wetlands, migratory species of the Pacific flyway, and wildlife movement

corridors through careful environmental review of proposed development applications, including consideration of cumulative impacts, participation in comprehensive habitat management programs with other local and resource agencies, and continued acquisition and management of open space lands that provide for permanent protection of important natural habitats.

Policy BIO-1.3: Protect Woodlands, Forests, and Tree Resources. Protect large native trees, trees with historical importance; oak woodlands; healthy and safe eucalyptus groves that support colonies of monarch butterflies, colonial nesting birds, or known raptor sites; and forest habitats. Prevent the untimely removal of trees through implementation of standards in the Development Code and the Native Tree Preservation and Protection Ordinance. Encourage other local agencies to adopt tree preservation ordinances to protect native trees and woodlands, regardless of whether they are located in urban or undeveloped areas.

Goal CD-1: Environmental Corridor Land Use Framework. Establish, maintain, and continue to improve a broad land use management framework using the County's environmental corridors as a basis for local policies and regulation, and to maintain the character of each of the corridors.

Program CD-1.d Maintain Agriculture in the Inland Rural Corridor. Work with individual landowners; special districts; local State, and federal agencies; and private groups to ensure that rural character is preserved, agricultural operations remain viable in the Inland Rural Corridor, and sensitive resources and existing communities are not threatened.

Program CD-4.d Coordinate with State and Federal Authorities. Coordinate with the National Park Service, the State Department of Parks and Recreation, and other appropriate agencies during review of development proposed for property within or adjacent to State or federal lands within and adjacent to Marin County.

Goal DES-4: Protection of Scenic Resources. Minimize visual impacts of development and preserve vistas of important natural features.

Policy DES-4.1: Preserve Visual Quality. Protect scenic quality and views of the natural environment — including ridgelines and upland greenbelts, hillsides, water, and trees — from adverse impacts related to development.

Program DES-4.b: Minimize Visual Impacts of Public Facilities. Amend applicable codes and procedures to require appropriate placement, design, setbacks, and native landscaping of public facilities (including sound-walls, medians, retaining walls, power lines, and water tanks) to reduce visual impacts, and encourage local agencies to adopt similar standards.

Goal TR-1: Safe and Efficient Movement of People and Goods. Provide a range of transportation options that meet the needs of residents, businesses, and travelers.

Policy TR-1.6: Keep Rural Character in West Marin. Maintain roads in West Marin as two-lane routes, with the possible additions of bicycle lanes, turn lanes at intersections, and turnouts for slow-moving traffic.

Program TR-1.o: Keep West Marin Rural. Limit West Marin roads to two lanes, and work with State and federal agencies and local communities to enhance road safety, improve pedestrian, bicycle, and transit access, and maintain or reduce congestion through means such as limiting local parking, creating a multipurpose path from West Marin to the City-Centered Corridor, and providing shuttle service to popular destinations. Shoulder widening for bicycles, turn lanes at intersections, turnouts for slow-moving traffic, traffic calming measures, and similar improvements would be permitted. However, projects will not be undertaken to increase the motorized vehicle capacity of West Marin roads.

Marin County Development Code. The broad purposes of the Marin Development Code are to protect and promote the public health, safety, comfort, convenience, prosperity, and general welfare of residents and businesses in Marin County and to implement the policies of the Marin Countywide Plan.

Chapter 22.27 Native Tree Protection and Preservation. Chapter 22.27 establishes regulations to preserve and protect native trees by limiting tree removal while allowing reasonable use and enjoyment of the property. Although the intent is to preserve and protect native trees, the chapter clarifies that it does not confer an obligation by the County to protect view-sheds. The intent of the chapter is to control the removal of protected trees and to maintain and enhance tree cover; to prevent the unpermitted wholesale removal of native trees prior to an application for development; to protect woodland environments on agricultural land; and to educate residents of the County about the functions, benefits and values of trees.

Protected trees may be removed in specific circumstances as clarified in Section 22.27.040 *Exemptions to the Prohibition on Removal of a Protected Tree* without requiring a permit. These exemptions include the following which is applicable to the proposed project:

K. The tree removal is by a public agency to provide for the routine management and maintenance of public land or to construct a fuel break.

Many of the redwoods within the public right-of-way within this section of SFDB meet the definition of "protected trees". However, given that the project is being initiated by a public agency "for the routine management and maintenance" of a public roadway, the proposed project, in accordance with Section 22.27.040 (k) of the County Code, would not trigger the requirement for a permit.

California State Scenic Highway Program. California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. A highway may be designated as "scenic" based on the expanse of the natural landscape that can be seen by travelers, the scenic quality of that landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. A Scenic Corridor is described as the land generally adjacent to and visible from such a highway and is usually limited by topography and/or jurisdictional boundaries. In addition to State Highways, County roads are also eligible for scenic designation.

No designated State Scenic Highways are located within Marin County, although roadways throughout Marin, especially SFDB, offer views of the County's scenic resources. Approximately

1.5 miles west of the project site SFDB connects to State Route 1, which is also a highly scenic roadway that is similarly not designated as a State Scenic Highway.

4.2.3 Significance Criteria

Appendix G of the *CEQA Guidelines* provides that a project may have a significant impact on visual resources if it would:

- Have a substantial adverse effect on a scenic vista.
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- Substantially degrade the existing visual character or quality of the site and its surroundings.
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant impact related to visual quality if it would:

- Conflict with County goals and policies related to visual quality.
- Significantly alter the existing natural view sheds, including changes in natural terrain or vegetation.
- Significantly change the existing visual quality of the region or eliminate significant visual resources.
- Significantly increase light and glare in the project vicinity.
- Significantly reduce sunlight or introduce shadows in areas used extensively by the public.

4.2.4 Impacts and Mitigation Measures

This section discusses potential impacts to the visual quality of the project site and vicinity that could result from the implementation of the proposed project. The section describes the visual components of the proposed project including an assessment of the potential change, if any, to the existing visual character of the project area. Impacts associated with the proposed project are identified, as well as mitigation measures, if appropriate. Less-than-significant impacts are discussed first, followed by significant impacts.

(1) Scenic Vista/Existing Viewshed. The project area is most visible to motorists and cyclists traveling along SFDB. Views of the roadway and its immediate environs are limited from nearby trails, the overhead pedestrian bridge, and the campgrounds at Samuel P. Taylor State Park. The key element in the scenic vista is the dense vegetation and forest, especially the large trees that are adjacent to and at some locations encroach on the roadway.

The proposed project design includes three features that have the potential to impact visual resources. These features are: (1) retaining wall improvements and slope repair; (2) vehicle pullouts; and (3)

roadway drainage modifications. Each of these improvements would require some degree of excavation and construction to accommodate a new design or engineering feature.

Most aspects of the proposed project, including repaving the surface, replacing culverts, and closing a series of roadway shoulders that are used as unofficial pullouts would not significantly alter the visual appearance of the roadway or affect a scenic vista. Closing unofficial pullouts would actually improve views by eliminating parked cars along the side of the road. However, the tree removal associated with proposed slope repair at Station 270+25 would have local visual effects but would not change the overall existing character of the roadway setting or a scenic vista.

The proposed slope stabilization work at Station 270+25 would require the removal of eight native trees (5 coast live oaks, 3 redwoods) some of which are protected under the County Tree Protection Ordinance (Marin County Code Chapter 22.27), as described in Section 4.2.2. Three of these trees (2 bays, 1 redwood) are relatively mature with sub-canopy heights of 50 to 60 feet; the others are smaller sub-canopy trees with heights ranging from 15 to 30 feet (Table 4.2.A). Figure 4.2-2 provides photographs of the trees that would be removed for the slope repair, keyed to a diagram showing the location of each tree.

Table 4.2.A: Tree Removal for Slope Repair at Station 270+25

	Tree Tag Number[19]	Species	Diameter (DBH)	Height
1	33	California Bay	16 inches	50 feet
2	32	Coast Redwood	32 inches	60 feet
3	(no tag)	Coast Redwood	8 inches	20 feet
4	(no tag)	California Bay	12 inches	20 feet
5	(no tag)	California Bay	12 inches	15 feet
6	31	Coast Redwood	12 inches	28 feet
7	(no tag)	California Bay	19 inches/19 inches (two trunks)	50 feet
8	30	California Bay	28 inches	50 feet

The majority of the trees proposed for removal as part of the slope repair work are not redwoods and are less than 18 inches in diameter. Of the 3 redwoods proposed for removal, one is 8 inches, one is 12 inches in diameter, and one is 32 inches in diameter. Of these three trees, the 32-inch redwood (Tag#32) is the most visibly prominent because of its size and immediate proximity to the roadway. The proposed tree removal for slope repair along this specific stretch of SFDB would not change the overall scenic vistas available from the roadway because the roadway's defining features such as the overarching canopy combined with other large trees that encroach on the roadway would remain in place.

Implementation of Option A would require the removal of nine native trees (eight redwoods and one coast live oak – see Table 4.2.B). The eight redwoods are relatively mature with canopy heights ranging from 70 to 120 feet. Figure 4.2-3 includes photographs of the trees that would be removed under Option A, keyed to a diagram showing the location of each tree.

[19] Tree tags from Arborist's Tree Survey (Horticultural Associates 2008).

Table 4.2.B: Tree Removal under Option A

	Station	Side of Road[20]	Tree Tag Number[21]	Species	Diameter (DBH)	Height
1	70+00	Left	580	Coast Live Oak	25/20 inches	35 feet
2	159+25	Right	1099	Coast Redwood	77 inches	80 feet
3	186+15	Right	1228	Coast Redwood	55 inches	90 feet
4	187+05	Right	1231	Coast Redwood	60/60 inches	90 feet
5	193+05	Left	422	Coast Redwood	24 inches	70 feet
6	193+20	Left	425	Coast Redwood	40 inches	80 feet
7	204+40	Right	1315	Coast Redwood	50 inches	80 feet
8	210+60	Right	366	Coast Redwood	78 inches	120 feet
9	277+00	Left	3	Coast Redwood	95 inches	120 feet

Marin County Code Chapter 22.27 provides protection for native trees (including oaks, bays and redwoods) that have specified minimum diameters. All of the trees that would be removed in Option A, exceed the minimum diameters under the Marin County Code and are therefore protected. Consistent with Marin County Code, Section 4.3, Biological Resources, includes mitigation to replace the trees to be removed at a 3:1 ratio (replaced: removed) (See Mitigation Measure BIO-8a). However, the replacement trees would not be planted in the same location and would not be the size and height of the trees removed.

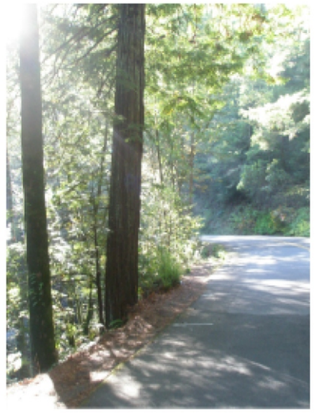
The removal of the nine protected trees would have local visual effects, but would not substantially modify the existing visual characteristics of the roadway setting. Many trees will remain that contribute significantly to the canopy that encloses the roadway. Therefore, the tree removal impact of Option A is deemed less-than-significant.

(2) Scenic Resources along a State Scenic Highway. According to the California Department of Transportation (Caltrans), no officially designated state scenic highways are located in the vicinity of the project site. The proposed project is not within view from any designated State Scenic Highway and would not affect scenic resources along a State Scenic Highway. Therefore, the proposed project would have a less-than-significant impact on scenic resources along a State Scenic Highway.

(3) Existing Visual Character or Quality. Sir Francis Drake Boulevard was originally constructed in 1926 to 1927, the route was improved with a poured concrete roadway in 1929 and the roadway has remained relatively unchanged since its opening in 1929.

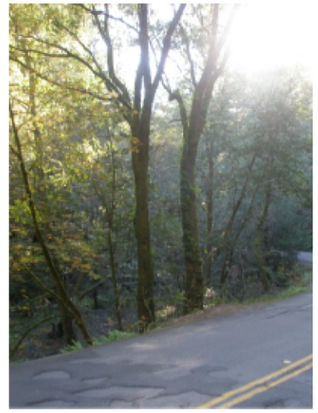
The proposed project includes four classes of improvements that would modify the existing engineering features, design characteristics, and natural setting of the roadway. These classes are: (1) pavement rehabilitation; (2) roadway alignment adjustments, retaining wall improvements, and slope repair; (3) vehicle pullouts; and (4) drainage feature replacement. Each class would require some degree of alteration of the existing roadway or roadway features to accommodate a design or

[20] Side of road travelling west toward Point Reyes Station.
[21] Tree tags from Arborist's Tree Survey (Horticultural Associates 2008).

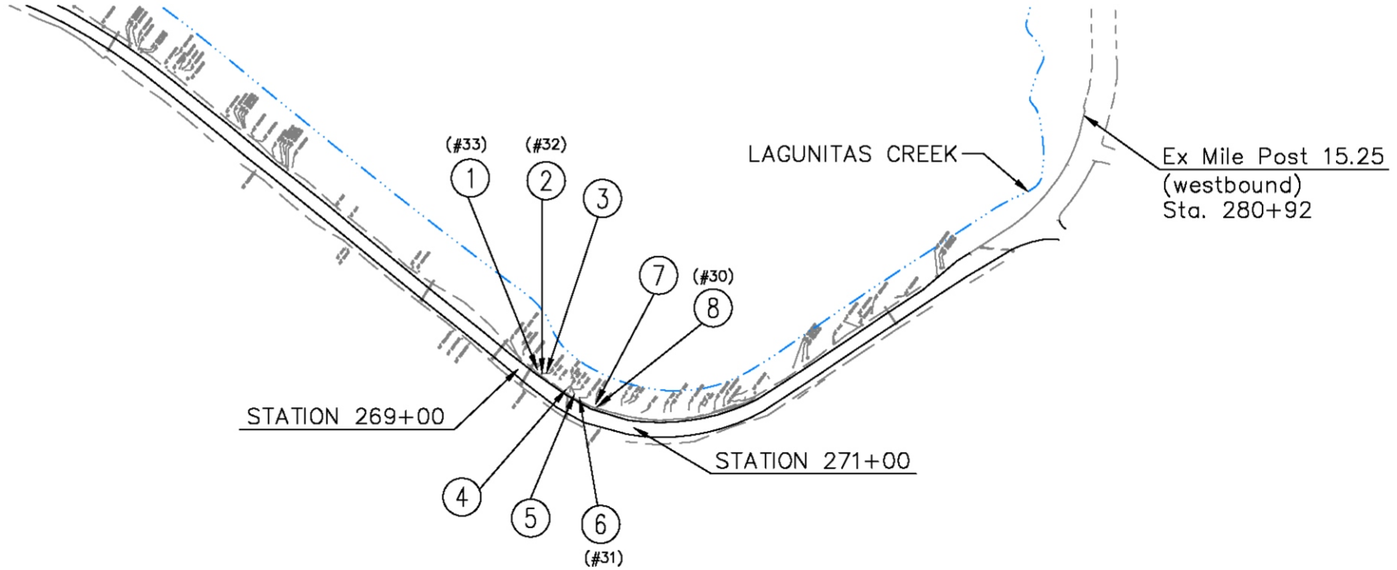


1 2 3 STA 269+15
(1) TAG #33 - 16" BAY
(2) TAG #32 - 32" REDWOOD
(3) NO TAG - 8" REDWOOD

4 5 6 STA 270+00
(4) NO TAG - 12" BAY
(5) NO TAG - 12" BAY
(6) TAG #31 - 12" BAY



7 8 STA 270+50
(7) NO TAG - 19"/19" BAY
(8) TAG #30 - 28" BAY



LSA

FIGURE 4.2-2

Sir Francis Drake Roadway Improvements Project

Tree Removal for Slope Repair

NOT TO SCALE

SOURCE: BKF ENGINEERS, 2010

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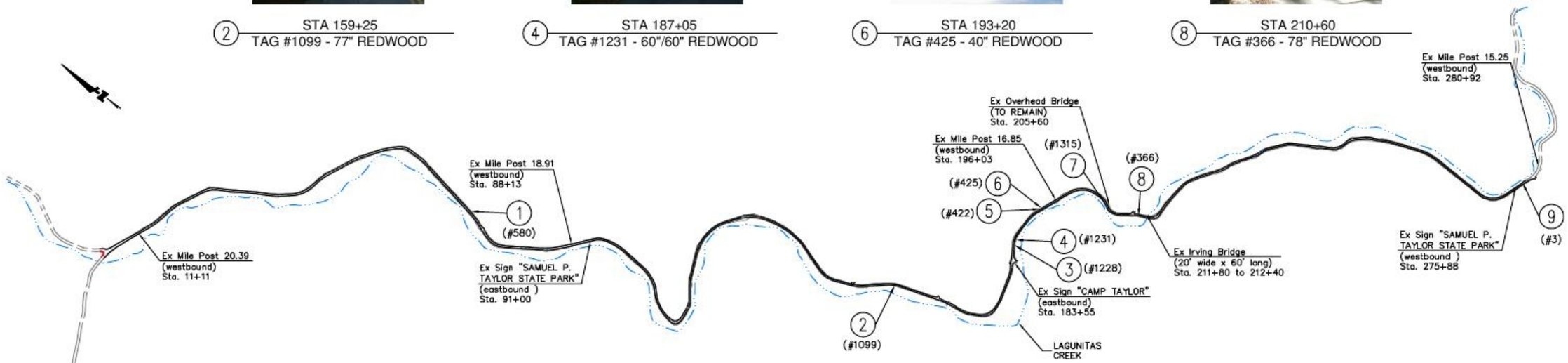
Back of Figure 4.2-2

2 STA 159+25
TAG #1099 - 77" REDWOOD

4 STA 187+05
TAG #1231 - 60"/60" REDWOOD

6 STA 193+20
TAG #425 - 40" REDWOOD

8 STA 210+60
TAG #366 - 78" REDWOOD



1 STA 70+00
TAG #580 - 25"/20" OAK

3 STA 186+15
TAG #1228 - 55" REDWOOD

5 STA 193+05
TAG #422 - 24" REDWOOD

7 STA 204+40
TAG #1315 - 50" REDWOOD

9 STA 277+00
TAG #3 - 95" REDWOOD

LSA

FIGURE 4.2-3

Sir Francis Drake Roadway Improvements Project

Tree Removal for Option A

NOT TO SCALE

SOURCE: BKF ENGINEERS, 2010

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Back of Figure 4.2-3

construction feature. These alterations would modify the existing physical characteristics and form of SFDB that contribute to its visual character. Each class of alterations and the potential for impacts from these modifications are discussed below.

Pavement Rehabilitation. The proposed project would repair and rehabilitate the surface of the SFDB roadway. This work would include, in some segments, the structural cracking and compacting of the existing concrete slab roadway to stabilize the surface for new rubberized asphalt concrete. The roadway would then be repaved. Proposed pavement rehabilitation would alter portions of the original poured-concrete roadway but would not modify the visual appearance of the roadway with the exception of the roadway looking new rather than old and dilapidated. Accordingly, the visual impact to the appearance of the roadway is deemed less than significant.

Alignment Adjustments, Retaining Wall Improvements, and Slope Repair. The proposed project would include adjustments to portions of the SFDB alignment to conform to Caltrans design and safety guidelines and AASHTO. The adjustments would consist of alterations to portions of the roadway's horizontal alignment and width, thus shifting portions of the alignment from the original route in 1929.

Alignment Adjustments. The proposed project would make adjustments to the roadway's alignment and width, resulting in an alteration to the roadway's design, workmanship, and materials. The alterations would be localized and would take place within the same corridor used for the road. The materials and workmanship used to prepare the replacement surfaces would not substantially differ from the original construction techniques and the finished roadway would be visually similar. The alterations would be slight adjustments and would not diminish the design or aesthetic characteristics of the roadway. Accordingly the visual impacts of the alignment adjustments are deemed less-than-significant.

Retaining Wall Improvements and Slope Repair. The proposed project would construct segments of retaining wall on portions of the SFDB alignment to facilitate alignment adjustments and to repair a localized slope failure. Low retaining wall segments would be used to increase the shoulder width of the roadway without extending the grading limits. The low retaining walls of no more than 3 feet in height would total approximately 2,000 linear feet over the total distance of the project area of 5.2 miles as shown in Figure 3.4-6. The low retaining walls would be constructed from prefabricated, tinted concrete to provide a wood-like appearance as shown in Figure 3.4-7.

The localized slope repair near Station 270+25 as illustrated in Figure 3.4-3 would occur in the vicinity of Shafter Bridge. The localized slope repair would consist of the construction of a pier-supported cantilevered tie-back concrete retaining wall at the edge of the roadway. The wall would retain the subgrade of the road with no more than 2 feet visible above the roadway. An existing culvert would be routed downslope where an appropriate energy dissipation device would be installed. Similar to the low retaining walls, the concrete mixture would be tinted and textured to provide a wood-like appearance. Visual simulations of the proposed slope repair, including the retaining wall are provided in Figure 3.4-4.

The retaining walls and slope repair would introduce modern structures and erosion control features that will improve the roadway's integrity of design, workmanship and materials. The proposed slope repair design would restore the roadway to substantially the same visual appearance with the

exception of the new retaining wall. The retaining wall for the slope repair would be minimally visible from the roadway, but would be most visible from Lagunitas Creek. The retaining wall and slope repair would not substantially diminish the visual character of the roadway.

The proposed project would include the removal of 8 trees for the proposed slope repair at Station 270+25 near Shafter Bridge. All but one of the trees proposed for removal as part of the slope repair work are not redwoods, are less than 18 inches in diameter and do not encroach on the roadway. In considering the size of surrounding trees, these particular trees do not necessarily contribute to the existing visual character of the roadway. The redwood proposed for removal is 32 inches in diameter and over 100 feet tall. Although this large tree contributes to the scenic character of the roadway it is within the slope area that is failing which must be repaired. The impact of removing this one redwood would be less than significant given the abundance of the surrounding forest and the remaining large redwoods that encroach on the roadway. Therefore the visual impacts of tree removal for slope repair are deemed less-than-significant.

Vehicle Pullouts. The proposed project includes improvements to some of the existing wider shoulders along the roadway to create formal pullouts; thereby allowing slower vehicles to temporarily leave the roadway and to allow faster moving vehicles to pass. The construction of the pullouts would consist of localized widening to prepare a surface to be covered in porous pavement. Other existing roadside areas that are currently used as ad hoc pullouts are hazardous due to insufficient sight distance and non-engineered surfaces. The proposed project would prohibit continued use of these areas by vehicles with the placement of boulders that would obstruct vehicle access. The new formalized pullouts would be visible along the roadway. However, the pullouts would be intermittent and placed at intervals at a considerable distance from one another, and would not be visible as an aggregate change to the overall appearance of the roadway. The restriction of parking in the existing ad hoc pullouts would have a beneficial impact on the visual quality of SFDB, in that it would reduce the number of automobiles parked along the roadway thereby improving the aesthetic experience for motorists. The construction of pullouts would result in a less-than-significant impact to the visual character of SFDB.

Drainage Feature Replacement. The proposed project would replace all existing metal or plastic culverts and install a sub-drain at locations where the existing roadway slopes to existing bank creating a drainage problem. The culvert replacement would remove the existing culvert and reinstall a headwall at the inlet and outlet of each culvert pipe replacement. The subdrain would use a perforated pipe to convey collected water to the nearest culvert. Energy dissipation structures, not visible from the roadway, would be provided as needed. The replacement headwalls would be of comparable materials, and would serve a similar purpose: to stabilize the culvert structure and maintain proper roadway drainage. Although the headwalls would be the component of the culvert replacement that would be most visible from the roadway, the headwalls would not significantly alter the visual character of the roadway and surrounding area. Therefore the aesthetic/visual impact is deemed less-than-significant.

(4) Reduction in Sunlight or Introduction of Shadows in Areas Used by the Public.
Implementation of the proposed project, including, repaving the surface, replacing culverts, repairing the slope at Station 270+25, and closing a series of pullouts would not significantly reduce sunlight or introduce a substantial amount of new shadowing in public access areas adjacent to the project area, such as the Cross Marin trail that parallels SFDB through Samuel P. Taylor State Park. The removal

of eight trees (slope repair) to accommodate these changes would not reduce sunlight or introduce shadows in areas used by the public.

Under Option A, the roadway would be widened in selected stretches to provide additional shoulder width for bicycles. This roadway widening would result in the removal of eight redwoods and one oak thereby reducing existing cover and introducing sunlight into an area that currently lies within the shadow of the redwoods. The removal of these trees would not reduce sunlight or introduce shadows in areas used by the public. Therefore, reduction in sunlight and shadow impacts of the project are considered less-than-significant.

(5) Conflict with County Goals and Policies. Most aspects of the proposed project, including repaving the surface, replacing culverts, slope repair, and closing a series of pullouts would not significantly affect the visual character or scenic quality of the roadway and its surrounding and therefore, would not conflict with County goals and policies related to visual quality (see Section 4.2.2, Regulatory Framework above). The tree removal associated with slope repair work at Station 270+25 and road widening under Option A would change the visual experience for those familiar with traveling the roadway but would not alter the visual character of the roadway or the project area. The removal of 17 trees, given the number of trees (thousands) remaining in the project area would not change the visual character of the project area. Therefore, the project is consistent with various policies intended to ensure that future projects are sensitive to the surrounding visual context, including preservation of scenic quality and views of the natural environment. The project would have a less than significant impact in relation to consistency with these specific County policies.

Impact AES-1: Option A could increase the amount of light and glare visible to pedestrians, bicyclists and equestrians using the trail systems in the vicinity of the project area. (S)

Vehicles using SFDB are the existing source of sunlight glare during the day and a source of artificial light during the night. The proposed project would not result in an increase in the number of vehicles traveling on SFDB, and no roadway lighting is proposed. Therefore, the proposed project would not increase or create a new source of light or glare along the roadway. The existing trees currently provide some shielding to nearby trails and campgrounds from the light and glare of passing vehicles on SFDB. Tree removal associated with Option A could open up views toward the road from nearby trails and campgrounds thereby potentially increasing vehicle light and glare impacts on trail users and campers. This impact is deemed potentially significant unless mitigated.

> Mitigation Measure AES-1: The County shall identify those trees proposed for removal in Option A that currently shield campgrounds or trails from the light and glare of vehicles passing on SFDB. Prior to construction, the County shall include in its construction plans or designs, plantings, or other methods to reduce the potential impacts of vehicle glare and light impacts that would result from removal of these trees.

Significance After Implementation. Implementation of the mitigation measure AES-1 will reduce the potential light and glare impacts to ***less-than-significant***.

4.3 BIOLOGICAL RESOURCES

This section addresses the biological resources on the project site including: (1) vegetation communities and wildlife habitats; (2) regulatory context; (3) potentially-occurring special-status species; (4) sensitive habitats such as wetlands; and (5) potential impacts to biological resources associated with implementation of the proposed project. Mitigation measures are identified as necessary.

A literature review and field surveys were conducted to identify special-status plant and wildlife species, as well as sensitive habitats that could be present within the proposed project site and an area of 200 feet surrounding the project site (project study area). More information on the methods used to assess the biological resources of the project study area is provided in the *Biological Assessment* (Appendix E).

The scientific and English names for the plant and animal species and vegetation types used in this section are from the following sources: plant taxonomy - Hickman[22]; wildlife taxonomy - Laudenslayer et al,[23] and vegetation community types - Sawyer and Keeler-Wolf.[24]

4.3.1 Setting

The project study area is located within the Bay Area/Delta Bioregion, which encompasses the San Francisco Bay area and the Sacramento-San Joaquin River Delta. [25] The Bay Area/Delta Bioregion extends from the Pacific Ocean to the Sacramento Valley and San Joaquin Valley bioregions to the northeast and southeast, and a short stretch of the eastern boundary joins the Sierra Bioregion at Amador and Calaveras counties. The bioregion is bounded by the Klamath/North Coast Bioregion on the north and the Central Coast Bioregion to the south.

Vegetation Communities and Wildlife Habitat

Eight vegetation communities have been documented in the project study area. These vegetation communities are described below and are shown on Figures 7a and 7b in the *Biological Assessment* (Appendix E).

Seasonal Wetland. Seasonal wetlands are found primarily in roadside swales and ditches along either side of SFDB. Seasonal wetlands are also found within some streams and drainages, and on side slopes along the existing roadway. The roadside ditch/swale wetlands are characterized by freshwater emergent vegetation types consisting of ruderal non-native and native sedges, grasses and forbs adapted to seasonally saturated soils and periods of surface inundation. Dominant and subdominant plant species within this vegetative community are sedges (*Carex amplifolia, C. densa)*, European

[22] Hickman, J. (ed.). 1993. The Jepson Manual: Higher Plants of California. University of California Press. Berkeley, California.
[23] Laudenslayer, W.F., Jr. et al. 1991. A checklist of Amphibians, Reptiles, Birds, and Mammals of California. California Department of Fish and Game. 471pp.
[24] Sawyer, J.O. and T. Keeler-Wolf. A Manual of California Vegetation, California Native Plant Society
[25] Welsh, H. 1994. Bioregions: An Ecological and Evolutionary Perspective and a Proposal for California. California Fish and Game (80) 3:97-124.

pennyroyal (*Mentha pulegium*), sheep sorrel (*Rumex acetosella*), rush (*Juncus effusus*), umbrella sedge (*Cyperus eragrostis*) and miner's lettuce (*Claytonia perfoliata*).

Seasonal wetlands can provide food, cover, and water for numerous wildlife species and many species rely on fresh emergent wetlands for their entire life cycle. During periods of inundation, seasonal wetlands in roadside swales can provide feeding and foraging habitat for wading birds and waterfowl; however the narrowness of the swales, the very close proximity of the SFDB roadway, and the disturbances associated with relatively constant daytime traffic probably limit the utility of the habitat for feeding and foraging. Where stands of cattails and bulrushes predominate, particularly where not occurring directly along the roadside pavement, the habitat value is probably higher. Wildlife species commonly associated with this habitat in Marin County include song sparrow (*Melospiza melodia*), red-winged blackbird (*Agelaius phoeniceus*), northern raccoon (*Procyon lotor*), and California vole (*Microtus californicus*). Red-winged blackbirds were observed in this habitat during the field survey.

Streams/Riparian. The project study area contains various ephemeral, intermittent and perennial streams that are tributaries of Lagunitas Creek, a perennial stream that flows to Tomales Bay. Lagunitas Creek borders or lies in close proximity to SFDB within the project area along the roadway's entire length. SFDB crosses Lagunitas Creek at Irving Bridge at Station 212+00; however no rehabilitation work is proposed at this bridge crossing.

All tributary streams on the site drain from watershed areas located to the north and the west side of SFDB into Lagunitas Creek. The mapped segments of each tributary stream consist of the culverted reaches flowing beneath SFDB and small portions of the non-culverted beds and banks on either side. Major intermittent or perennial tributary streams that pass beneath SFDB include Barnabe Creek, McIssac Creek, Cheda Creek and Devils Gulch.

Lagunitas Creek has a stream width of 50 feet between ordinary high water mark (OHWM) with top-of-bank height of 12 feet at the Irvine Bridge crossing. Ephemeral tributaries on the project site typically are shallow (depths of 1 to 3 feet) and narrow (1 to 2 foot widths at the OHWM), have non-vegetated beds and banks, and lack riparian vegetation. Intermittent and perennial tributaries are typically deeper and wider with top-of-bank depths ranging from 2 to 10 feet and widths ranging from 2 to 8 feet at the OHWM.

Lagunitas Creek and its intermittent and perennial tributaries have stands of riparian vegetation within the study area. Riparian vegetation was observed within the upper banks and floodplains of Lagunitas Creek and tributary streams crossing under SFDB. This vegetative community is quite variable and often structurally diverse. Common canopy and shrub species within this community are: California buckeye (*Aesculus californica*), white alder (*Alnus rhombifolia*), creek dogwood (*Cornus sericea* var. *sericea*), California hazel (*Corylus cornuta* var. *californica*), Oregon ash (*Fraxinus latifolia*), Himalayan blackberry (*Rubus discolor*), thimbleberry (*Rubus parviflorus*), California blackberry (*Rubus ursinus*), arroyo willow (*Salix lasiolepis*), Sitka willow (*Salix sitchensis*), blue elderberry (*Sambucus Mexicana*) and California bay (*Umbellularia californica*).

Riparian forest habitat provides water, forage, breeding areas, migration and dispersal corridors, and thermal cover on a year-round and seasonal basis for an abundance of wildlife. Amphibians and reptiles that typically use this habitat include the Pacific treefrog (*Pseudacris regilla*), foothill yellow-

legged frog (*Rana boylii*), and several species of garter snake. Mesic areas with shallow pools may support California newts. Mammals that use this habitat for foraging and cover include northern raccoon, Virginia opossum (*Didelphis virginianus*), mule deer, coyote, bobcat, and mountain lion. Riparian woodlands in Marin County provide important nesting habitat for a variety of migratory birds such as Pacific-slope flycatcher (*Empidonax difficilis*), warbling vireo (*Vireo gilvus*), Swainson's thrush (*Catharus ustulatus*), and black-headed grosbeak (*Pheucticus melanocephalus*).

The project study area's perennial and intermittent streams provide habitat for a variety of other fish and wildlife species such as threespine stickleback (*Gasterosteus aculeatus*), California newt (*Taricha torosa*), belted kingfisher (*Ceryle alcyon*), and American dipper (*Cinclus mexicanus*). Some species of insectivorous birds such as barn swallows (*Hirundo rustica*) and black phoebe (*Sayornis nigricans*) will forage for flying insects over water. Bird species observed in this community during surveys included mallard (*Anas platyrhynchos*), great blue heron (*Ardea herodias*), northern raccoon, Pacific treefrog, house wren (*Troglodytes aedon*), and mourning dove.

Lagunitas Creek provides important spawning and rearing habitat for special status salmonid species, steelhead (*Oncorhynchus mykiss*), coho salmon (*O. kisutch*), California coastal chinook salmon (*Oncorhynchus tshawytscha*) and chum salmon (*O. keta*). One or more of these species also occur within the Cheda Creek, McIssac Creek and Devil's Gulch tributaries, and may have historically occurred in other tributary streams in the project study area.[26]

Annual Grassland. Annual grassland vegetative community was observed primarily within the western one-third of the project study area on the north side of SFDB. This plant community is generally composed of introduced grasses and broadleaf weedy species, which quickly re-colonize disturbed areas.

Common dominant and subdominant plant species within this vegetative community are: slim oat (*Avena barbata*), field mustard (*Brassica rapa*), rattlesnake grass (*Briza maxima*, *Briza minor*), soft chess (*Bromus hordeaceus*), woodland brome (*Bromus laevipes*), Italian thistle (*Carduus pycnocephalus*), bull thistle (*Cirsium vulgare*), bindweed (*Convolvulus arvensis*), orchard grass (*Dactylis glomerata*), annual Italian ryegrass (*Lolium multiflorum*), and perennial ryegrass (*Lolium perenne*).

Annual grasslands provide important habitat for various species of lizards and snakes, foraging raptors, various songbirds and small mammals. Typical wildlife of annual grasslands in Marin County include gopher snake (*Pituophis catenifer*), racer (*Coluber constrictor*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), western meadowlark (*Sturnella neglecta*), and savanna sparrow (*Passerculus sandwichensis*). Common mammals include California ground squirrel (*Spermophilus beecheyi*) and Botta's pocket gophers (*Thomomys bottae*).

Wildlife species observed in this community or flying over during surveys include Cooper's hawk (*Accipiter cooperii*), red-winged blackbird, house finch (*Carpodacus mexicanus*), turkey vulture (*Cathartes aura*), killdeer (*Charadrius vociferus*), common raven, black-tailed jackrabbit (*Lepus californicus*), California ground squirrel, wild turkey (*Meleagris gallopavo*), coyote (*Canis latrans*),

[26] Ross Taylor and Associates. 2003. Marin County Stream Crossing Inventory and Fish Passage Evaluation – Final Report. Prepared for the County of Marin Department of Public Works. July 2003. 73pp.

mule deer (*Odocoileus hemionus*), western fence lizard (*Sceloporus occidentalis*) western bluebird (*Sialia mexicana*), and western meadowlark.

Coastal Oak Woodland. Coastal oak woodland is associated with annual grassland areas within the western one-third of the project study area on the north side of SFDB. This is a highly variable community that is generally dominated by deciduous and evergreen hardwoods, particularly oaks. The canopy can be closed with an understory of shrubs, ferns, and forbs or a dense layer of litter with sparse vegetation. The canopy can also be open savannah with an understory of grasses, forbs, and shrubs, which is the typical manifestation of this community in the project study area. Slope, soil, precipitation, and moisture relationships determine the composition of this vegetative community.

Common dominant and subdominant plant species that were observed within this vegetative community were: coast live oak (*Quercus agrifolia*), canyon live oak (*Quercus chrysolepis*), California bay, Pacific madrone (*Arbutus menziesii*), tanbark oak (*Lithocarpus densiflorus),* California blackberry (*Rubus ursinus*), creeping snowberry (*Symphoricarpos mollis*), toyon (*Heteromeles arbutifolia*), bracken fern (*Pteridium aquilinum*), California polypody (*Polypodium californicum*), fiesta flower (*Polypodium californicum*), miner's lettuce, coyote brush (*Baccharis pilularis*), chamise (*Adenostoma fasciculatum*), and ceanothus species (*Ceanothus* sp.). In drier, savannah areas, the understory can consist almost entirely of species named in California Annual Grassland above.

Coastal oak woodlands provide habitat for a variety of wildlife species. At least 60 species of mammals may use oaks in some way. One hundred ten (110) species of birds can be observed during the breeding season in California habitats where oaks form a significant part of the canopy or subcanopy. Quail (*Callipepla californica*), turkeys (*Meleagris gallopavo*), squirrels (Family Sciuridae), and black-tailed deer may be so dependent on acorns in fall and early winter that a poor acorn year can result in significant declines in their populations.

Common wildlife species observed in this community during surveys included western scrub jay (*Aphelocoma californica*), red-tailed hawk, common raven, Stellar's jay (*Cyanocitta stelleri*), wild turkey, California towhee (*Pipilo crissalis*), western fence lizard, mourning dove (*Zenaida macroura*), white-throated sparrow (*Zonotrichia albicollis*), golden-crowned sparrow (*Zonotrichia atricapilla*), and white-crowned sparrow (*Zonotrichia leucophrys*).

Coastal Scrub. The coastal scrub vegetative community was observed on the north side of SFDB within the portions of the central section of the project study area. This vegetative community is typified by low to moderate-sized shrubs with mesophytic leaves, flexible branches, semi-woody stems growing from a woody base, and a shallow root system. This community consists of a dense and continuous two-layer cover of tall, overstory shrubs with a short, perennial herb/sub-shrub understory. Coastal scrub seems to tolerate drier conditions than its associated communities. It is typical of areas with steep, south-facing slopes; sandy, mudstone or shale soils; and low average annual rainfall.

Common dominant and subdominant plant species within this vegetative community are: coyote brush, California sagebrush (*Artemisia californica*), poison-oak (*Toxicodendron diversilobum*), bracken fern (*Pteridium aquilinum*), sword fern (*Polystichum munitum*), blue blossom ceanothus (*Ceanothus thrysiflorus*), coffeeberry (*Rhamnus californica*), and bush monkeyflower (*Mimulus*

aurantiacus). Other common species include black sage (*Salvia mellifera*), bush lupine (*Lupinus arboreus*), many-colored lupine (*Lupinus argenteus*), western hazelnut (*Corylus cornuta*), salal (*Gaultheria shallon*), blackberry (*Rubus* spp.), wax myrtle (*Myrica californica*), wooly sunflower (*Eriophyllum maximum),* cow parsnip (*Heracleum lanatum*), Indian paintbrush (*Castilleja* spp.), yerba buena (*Clinopodium douglasii*), California oatgrass (*Danthonia californica*), and California buckwheat (*Eriogonum fasciculatum*).

The coastal scrub community provides foraging, perching and nesting sites for some birds and cover for small mammals and reptiles. Common species associated with the community include western fence lizard, California quail, western scrub-jay, California towhee, and brush rabbit (*Sylvilagus bachmani*).

Common wildlife species observed in this community during surveys included western scrub jay, California quail, American goldfinch (*Carduelis tristis*), black-tailed jackrabbit, California towhee, chestnut-backed chickadee (*Poecile rufescens*), and western fence lizard.

Mixed Evergreen Forest. The mixed evergreen forest community occurs within the project study area intermixed in upland areas with annual grassland and intergrades with the redwood and riparian vegetative communities. Mixed evergreen forest is composed of a pronounced hardwood tree layer, with an infrequent and poorly developed shrub stratum, and a sparse herbaceous layer. In mature stands, the hardwood tree canopy tends to be uniform, but is subordinate to conifers. A very stable community, the large number of species in the type, both conifer and hardwood, allow it to occupy and persist on a wide range of sites.

Common canopy and subcanopy tree and shrub species that were observed within this community during biological surveys included: California buckeye, tanbark oak, madrone, Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), coast live oak, canyon live oak and coast redwood (*Sequoia sempervirens*). Common understory plants include: pearly everlasting (*Anaphalis margaritacea*), California pipe-vine (*Aristolochia californica*), wild ginger (*Asarum caudatum*), coastal lady fern (*Athyrium filix-femina* var. *cyclosorum*), coastal wood fern (*Dryopteris arguta*), wood-sorrel (*Oxalis albicans* ssp. *pilosa*), California polypody, western sword fern, bracken fern (*Pteridium aquilinum* var. *pubescens*), western rhododendron (*Rhododendron macrophyllum*), western azalea (*Rhododendron occidentale*), wood rose (*Rosa gymnocarpa*), spoon-leaved stonecrop (*Sedum spathulifolium*), huckleberry (*Vaccinium ovatum*), periwinkle (*Vinca* sp.), western chain fern (*Woodwardia fimbriata*), and coast range mule ears (*Wyethia glabra*).

Bird and mammal species typically found in mixed evergreen forest include Stellar's jay, band-tailed pigeon (*Columba fasciata*) and mule deer. Many amphibians and reptiles are found on the forest floor in the mixed evergreen community. Among them are ensatina (*Ensatina eschscholtzii*), California slender salamander (*Batrachoseps attenuatus*), and western fence lizard. Snakes include rubber boa (*Charina bottae*) and ring-necked snake (*Diadophis punctatus*). Common wildlife species observed in this community during surveys included western scrub jay, California slender salamander, California quail, pileated woodpecker (*Dryocopus pileatus*), Stellar's jay, and golden-crowned sparrow.

Redwood Forest. The redwood vegetative community was observed primarily along SFDB within the eastern half of the project study area. This community was also found in scattered areas within the western half of the project study area, however in much lower density. This vegetative community is

restricted to coastal areas of California where temperature regimes are relatively stable and within the influence of summer coastal fog and inland marine air flows.

Common canopy and subcanopy tree and shrub species that were observed within this community during biological surveys included: Douglas-fir, coast redwood, madrone and tanbark oak. Woody understory and herbaceous plants commonly observed were: five-finger fern, California maidenhair, wild ginger, coastal lady fern, brook foam (*Boykinia occidentalis*), blue blossom (*Ceanothus thyrsiflorus*), brittle fern (*Cystopteris fragilis*), bleeding heart (*Dicentra formosa*), coastal wood fern, alum-root (*Heuchera micrantha*), ocean-spray (*Holodiscus discolor*), wood-sorrel (*Oxalis albicans* ssp. *pilosa*), redwood sorrel (*Oxalis oregano*), western coltsfoot (*Petasites frigidus* var. *palmatus*), ninebark (*Physocarpus capitatus*), bracken fern, western rhododendron, western azalea, mist maiden (*Romanzoffia californica*), fetid adder's tongue (*Scoliopus bigelovii*), fringe-cups (*Tellima grandiflora*), huckleberry, inside-out flower (*Vancouveria planipetala*), periwinkle, redwood violet (*Viola sempervirens*), and western chain fern.

In Marin County redwood forests provide habitat for wildlife that prefer deep shade and relatively mesic conditions such as the California giant salamander (*Dicamptodon ensatus*), northern spotted owl (*Strix occidentalis caurina*), winter wren (*Troglodytes troglodytes*), and varied thrush (*Ixoreus naevius*). Wildlife species observed in this community during surveys included western scrub jay, Stellar's jay, pileated woodpecker, California towhee, and Chestnut-backed chickadee.

Ruderal/Disturbed. The ruderal/disturbed vegetative community occurs in portions of the project area with disturbed soils and on other areas with existing or past human disturbances. This vegetative community was primarily observed along the shoulders of SFDB. Typical vegetative species found in this community are weedy non-native species.

Common dominant and subdominant plant species that were observed during surveys included: fiddleneck, slim oat, field mustard, soft chess, shepherd's purse (*Capsella bursa-pastoris*), Italian thistle, mouse-ear chickweed (*Cerastium glomeratum*), pineapple weed (*Chamomilla suaveolens*), bull thistle, bindweed, foxglove, northern willow herb, broad-leaf filaree, red-stem filaree, petty spurge (*Euphorbia peplus*), fennel, salal, French broom, cut-leaved cranesbill (*Geranium dissectum*), shortpod mustard (*Hirschfeldia incana*), bur clover, bristly ox tongue, common plantain, radish, hedge mustard (*Sisymbrium officinale*), chickweed (*Stellaria media*), dandelion, and vetch (*Vicia villosa* ssp. *varia*).

Ruderal/disturbed areas, particularly areas with landscaping vegetation, can provide moderate habitat value for wildlife. This vegetative community provides habitat for opportunistic animal species that can coexist with humans and human-related disturbances. Examples of species found in this habitat type are Anna's hummingbird (*Calypte anna*), northern mockingbird (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), northern raccoon, and Virginia opossum. Wildlife species observed in this community during surveys included American goldfinch (*Spinus tristis*), house finch, common raven, black-tailed jackrabbit, house sparrow (*Passer domesticus*), western fence lizard, western meadowlark, and mourning dove.

Sensitive Habitats

Sensitive habitats are especially diverse, regionally uncommon habitats as defined by the California Natural Diversity Database (CNDDB), and/or regulated by state or federal agencies (e.g., Section 404 of the Clean Water Act, CWA). Most sensitive habitats are given special consideration because they provide important ecological functions, including filtering of surface waters (wetlands) and providing essential habitat for common and special-status plant and wildlife species. The freshwater seasonal wetlands, streams, redwood forest, and riparian communities described previously qualify as sensitive habitats in the project study area.

Wildlife Movement Corridors

Wildlife movement includes migration (i.e., usually one way per season), inter-population movement (i.e., long-term genetic flow) and small travel pathways (i.e., daily movement corridors within an animal's territory). While small travel pathways usually facilitate movement for daily home range activities such as foraging or escape from predators, they also provide connection between outlying populations and the main corridor, permitting an increase in gene flow among populations.

Open space areas (Samuel P. Taylor State Park and the GGNRA) on either side of SFDB provide a suitable movement corridor for a variety of common wildlife species. However, the utility of the wildlife movement corridor between habitats north and south of SFDB is somewhat reduced by vehicular traffic. Movement across SFBD by smaller mammals, amphibians, reptiles, and other less mobile wildlife species is probably more negatively affected by traffic than for larger mammals and other more mobile wildlife species. Movement by diurnal wildlife species that are active when the traffic volumes are highest are expected to be the most limited by traffic. However, because SFDB is only a two-lane, non-urban roadway, and traffic is much less constant than on other larger roadway types, wildlife would be expected to regularly cross SFDB to access habitat areas north and south of SFDB.

Water conveying structures (i.e., culverts) traversing under SFDB are also potential movement corridors for small mammals, reptiles, and amphibians between wildlife areas north and south of SFDB. These culverts allow wildlife to cross safely under the roadway without the danger of mortality from automobiles and other types of vehicles. The potential of the culverts to allow passage by terrestrial and aquatic fauna varies depending on culvert size and elevation of the culverts' downstream inverts relative to the existing slope and the OHWM in Lagunitas Creek and tributaries. The *Biological Assessment* (Appendix E) indicates that at least 32 of the 72 culverts that occur within the project site may have the potential to provide significant terrestrial and/or aquatic faunal passage. These include three box or arch culverts that are capable of allowing relatively unimpeded passage by all age classes of salmonids, based on the percent of passable flows and water depths relative to swimming abilities and depth requirements of the salmonids. These box and/or arch culverts are at the Cheda Creek, McIssac Creek and Devil's Gulch crossings.

Special Status Species

The special-status species evaluated for this project include state and/or federal listed Endangered and Threatened species, state and federal species proposed or candidates for listing, California Species of Concern, or California Native Plant Society (CNPS) List 1 and 2 plants (see Section 4.3.2, Regulatory

Framework), and CNPS List 3 and 4 species which may be included as special-status species on the basis of local significance or recent biological information. Also included are animal species that do not fall in these categories but may qualify as "Rare" under Section 15380 of the *CEQA Guidelines*, based on their limited areas of occurrence. The special-status species evaluated have a reasonable potential to occur in the project area based on their distribution and habitat requirements and/or CNDDB occurrences from the region. All species evaluated are listed and discussed in Tables 4.3.A (Plants) and 4.3.B (Animals). The *Biological Assessment* (Appendix E) provides more detailed species accounts, habitat descriptions and information on the presence or potential presence of each species.

Plants. Special-status plant species potentially occurring in the project study area were defined as those special-status species with known populations in or near the project study area and those known from habitats either identical to or similar to those found in the project study area. Forty-four special-status plant species were evaluated for the proposed project. Of these species, eight have been documented in the vicinity of the project study area and twenty-one additional plant species have the potential to occur.

Field surveys were conducted between April 2007 and February 2008 on both sides of SFDB for the full length of the project site and were conducted from the edge of the roadway to a distance 50 feet from the road edge. No sensitive plant species or populations were detected during these botanical surveys.

Invertebrates. Six special-status invertebrate species were evaluated for their potential to occur in the project study area. Of these species, three have been documented or were observed within the project study area and two additional species have the potential to occur. Of the species with high potential to occur in the project study area, one is a federally and state listed Endangered species.

Federal and State Listed Invertebrates:

California freshwater shrimp (*Syncaris pacifica*) is a federal and California listed Endangered species that is known to occur in Lagunitas Creek and has been documented in the project study area, although not observed during field surveys. This species occurs in pool areas of low-elevation, low-gradient streams, among exposed live tree roots of undercut banks, overhanging woody debris (primarily willows and alders), or overhanging vegetation. These streams have low summer flows but may transport heavy runoff during the rainy season. Potential habitat for this species does occur in the project study area; thus, the potential for this species to occur is high.

Other Special Status Invertebrates:

Marin elfin butterfly (*Callophrys mossii marinensis*) may meet the definition of "rare" under Section 15380 of the CEQA guidelines, based on its limited area of occurrence. This species has a high potential to occur in the project study area. This species was not observed during field surveys but has been documented within the project area in the vicinity of Shafter Bridge. Potential habitat for this species occurs and its host plant (spoon-leaved stonecrop) was observed in the project study area.

Table 4.3.A: Special-Status Plant Species Evaluated at the Sir Francis Drake Improvement Project Site, Marin County, California

Species	Status* (Federal/State /CNPS)	Habitat Requirements	Potential Habitat Present/Species Observed or Documented within the Project Study Area
Abronia umbellata var. *breviflora* Pink sand verbena	--/--/1b	Coastal dunes and coastal strand. Foredunes and interdunes with sparse cover. Elevational range: 0 to 12 meters. Blooming period: June through October.	No/No
Alopecurus aequalis var. *sonomensis* Sonoma alopecurus	FE/--/1b	Freshwater marshes and swamps, riparian scrub. Found in wet areas, marshes, and riparian banks with other wetland species. Elevational range: 5 to 360 meters. Blooming period: May through July.	Yes/No
Amorpha californica var. *napensis* Napa false indigo	--/--/1b	Broadleaf upland forest, chaparral, and cismontane woodland. Found in openings in forest, woodland, or chaparral. Elevational range: 150 to 2,000 meters. Blooming period: April through July.	Yes/No
Amsinckia lunaris Bent-flowered fiddleneck	--/--/1b	Coastal bluff scrub, cismontane woodland, and valley and foothill grassland. Elevational range: 3 to 500 meters. Blooming period: March through June.	Yes/No
Arctostaphylos hookeri var. *Montana* Mt. Tamalpais Manzanita	--/--/1b	Chaparral, and valley and foothill grassland. Found on serpentine slopes. Elevational range: 160 to 760 meters. Blooming period: February through April.	Yes/No
Arctostaphylos virgata Marin Manzanita	--/--/1b	Broadleafed upland forest, closed-cone coniferous forest, chaparral, and north coast coniferous forest. Found on sandstone or granitic soil. Elevational range: 60 to 700 meters. Blooming period: January through March.	Yes/No
Astragalus pycnostachyus var. *pycnostachyus* Coastal Marsh Milk-vetch	--/--/1b	Coastal dunes, coastal salt marshes, and coastal scrub. Found on mesic sites in dunes or along streams or coastal salt marshes. Elevational range: 0 to 30 meters. Blooming period: April through October.	No/No
Campanula californica Swamp Harebell	--/--/1b	Bogs, fens, closed-cone coniferous forest, coastal prairie, meadows, freshwater marsh, and north coast coniferous forest. Elevational range: 1 to 405 meters. Blooming period: June through October.	Yes/No
Carex lyngbyei Lyngbye's sedge	--/--/2	Brackish and freshwater marshes and swamps. Elevational range: 0 meters. Blooming period: May through August.	No/No
Castilleja affinis var. *neglecta* Tiburon Indian paintbrush	FE/CT/1b	Valley and foothill grassland on rocky serpentine soils. Elevational range: 60 to 400 meters. Blooming period: April through June.	Yes/No
Castilleja ambigua var. *humboldtiensis* Humboldt Bay owl's clover	--/--/1b	Coastal salt marsh and swamps. Elevational range: 0 to 3 meters. Blooming period: April through August.	No/No

Species	Status* (Federal/State /CNPS)	Habitat Requirements	Potential Habitat Present/Species Observed or Documented within the Project Study Area
Ceanothus gloriosus var. *porrectus* Mt. Vision ceanothus	--/--/1b	Closed-cone coniferous forest, coastal prairie, coastal scrub, and valley and foothill grassland. Elevational range: 25 to 305 meters. Blooming period: February through May.	Yes/No
Cirsium andrewsii Franciscan thistle	--/--/1b	Coastal bluff scrub, broadleaved upland forest, coastal scrub, and coastal prairie. Elevational range: 0 to 150 meters. Blooming period: March through July.	Yes/No
Cirsium hydrophilum var. *vaseyi* Mt. Tamalpais thistle	--/--/1b	Broadleaf upland forest, chaparral, meadows, and seeps. Elevational range: 265 to 620 meters. Blooming period: May through August.	Yes/No
Cordylanthus maritimus var. *palustris* Point Reyes bird's-beak	--/--/1b	Coastal salt marsh and swamp. Elevational range: 0 to 15 meters. Blooming period: June through October.	No/No
Dirca occidentalis Western leatherwood	--/--/1b	Broadleaf upland forest, chaparral, closed-cone coniferous forest, cismontane woodland, north coast conifer forest, and riparian forest. Found on brushy slopes and mesic sites, mostly in mixed evergreen and foothill woodland communities. Elevational range: 30 to 550 meters. Blooming period: January through April.	Yes/No
Entosthodon kochii Koch's cord-moss	--/--/1b	Cismontane woodland. Elevational range: 180 to 1,000 meters. Blooming period: none.	Yes/No
Eriogonum luteolum var. *caninum* Tiburon buckwheat	--/--/3	Chaparral, coastal prairie, and valley and foothill grassland. Found on sepentine soils. Elevational range: 10 to 500 meters. Blooming period: May through September.	Yes/No
Fritillaria lanceolata var. *tristulis* Marin checker lily	--/--/1b	Coastal bluff scrub, coastal scrub, and coastal prairie. Elevational range: 15 to 150 meters. Blooming period: February through April.	No/No
Fritillaria liliacea Fragrant fritillary	--/--/1b	Coastal scrub, valley and foothill grassland, coastal prairie, and cismontane woodland. Elevational range: 3 to 410 meters. Blooming period: February through April.	Yes/No
Gilia capitata var. *chamissonis* Dune gilia	--/--/1b	Coastal dunes and coastal scrub. Elevational range: 2 to 200 meters. Blooming period: April through July.	No/No
Gilia capitata var. *tomentosa* Woolly-headed gilia	--/--/1b	Coastal bluff scrub. Elevational range: 15 to 155 meters. Blooming period: May through July.	No/No
Grindelia hirsutula var. *maritime* San Francisco gumplant	--/--/1b	Coastal bluff scrub, coastal scrub, and valley and foothill grassland. Found in sandy or serpentine soils. Elevational range: 15 to 400 meters. Blooming period: June through September.	Yes/No
Hesperevax sparsiflora var. *brevifolia* Short-leaved evax	--/--/2	Coastal bluff scrub and coastal dunes. Elevational range: 0 to 215 meters. Blooming period: March through June.	No/No

Species	Status* (Federal/State /CNPS)	Habitat Requirements	Potential Habitat Present/Species Observed or Documented within the Project Study Area
Hesperolinon congestum Marin western flax	FT/CT/1b	Chaparral and valley and foothill grassland. Found in serpentine barrens and in serpentine grassland and chaparral. Elevational range: 5 to 370 meters. Blooming period: April through July.	Yes/No
Horkelia marinensis Point Reyes horkelia	--/--/1b	Coastal dunes, coastal prairie, and coastal scrub. Elevational range: 5 to 350 meters. Blooming period: May through September.	No/No
Layia carnosa Beach layia	FE/CE/1b	Coastal dunes and coastal scrub. Elevational range: 0 to 60 meters. Blooming period: March through July.	No/No
Lessingia hololeuca Woolly-headed lessingia	--/--/3	Broadleaf upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland. Found on clay and serpentine soils. Elevational range: 15 to 305 meters. Blooming period: June through October.	Yes/No
Lilaeopsis masonii Mason's lilaeopsis	--/CR/1b	Freshwater and brackish marshes and swamps, riparian scrub. Elevational range: 0 to 10 meters. Blooming period: April through November.	No/No
Lilium maritimum Coast lily	--/--/1b	Closed-cone coniferous forest, coastal prairie, coastal scrub, broadleaf upland forest, north coast coniferous forest, and freshwater marsh and swamp. Elevational range: 5 to 335 meters. Blooming period: May through August.	Yes/No
Microseris paludosa Marsh microseris	--/--/1b	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland. Elevational range: 5 to 300 meters. Blooming period: April through July.	Yes/No
Navarretia rosulata Marin County navarretia	--/--/1b	Closed-cone coniferous forest and chaparral. Found In serpentine and rocky soils. Elevational range: 200 to 635 meters. Blooming period: May through July.	Yes/No
Phacelia insularis var. *continentis* North coast phacelia	--/--/1b	Coastal bluff scrub and coastal dunes. Elevational range: 10 to 160 meters. Blooming period: March through May.	No/No
Pleuropogon hooverianus North coast semaphore grass	--/CT/1b	Broadleaf upland forest, meadows and seeps, and north coast coniferous forest. Elevational range: 10 to 671 meters. Blooming period: April through August.	Yes/No
Polygonum marinense Marin knotweed	--/--/3	Freshwater marshes and swamps. Coastal salt marshes and brackish marshes. Elevational range: 0 to 10 meters. Blooming period: April through October.	Yes/No
Quercus parvula var. *tamalpaisensis* Tamalpais oak	--/--/1b	Lower montane coniferous forest. Elevational range: 100 to 750 meters. Blooming period: March through April.	Yes/No

Species	Status* (Federal/State /CNPS)	Habitat Requirements	Potential Habitat Present/Species Observed or Documented within the Project Study Area
Rhynchospora californica California beaked-rush	--/--/1b	Bogs, fens, marshes, swamps, lower montane coniferous forest, meadows, and seeps. Elevational range: 45 to 1,010 meters. Blooming period: May through July.	Yes/No
Sidalcea calycosa var. *rhizomata* Point Reyes checkerbloom	--/--/1b	Marshes and swamps. Elevational range: 5 to 75 meters. Blooming period: April through September.	Yes/No
Sidalcea hickmanii var. viridis Marin checkerbloom	--/--/1b	Chaparral on serpentine or volcanic soils. Sometimes appears after burns. Elevational range: 50 to 430 meters. Blooming period: May through June.	No/No
Streptanthus batrachopus Tamalpais jewel-flower	--/--/1b	Closed-cone coniferous forest and chaparral. Found in serpentine soils. Elevational range: 305 to 650 meters. Blooming period: April through June.	Yes/No
Streptanthus glandulosus var. *pulchellus* Mt. Tamalpais jewel-flower	--/--/1b	Chaparral and valley and foothill grassland. Elevational range: 150 to 800 meters. Blooming period: May through July.	Yes/No
Trifolium amoenum Showy Indian clover	FE/--/1b	Valley and foothill grassland and coastal bluff scrub. Sometimes found on serpentine soil, open sunny sites, and swales. Elevational range: 5 to 415 meters. Blooming period: April through June.	Yes/No
Triphysaria floribunda San Francisco owl's-clover	--/--/1b	Coastal prairie, coastal scrub, and valley and foothill grassland. Usually found on serpentine soils. Elevational range: 10 to 160 meters. Blooming period: April through June.	Yes/No
Triquetrella californica Coastal triquetrella	--/--/1b	Coastal bluff scrub and coastal scrub. Elevational range: 10 to 100 meters. Blooming period: None.	No/No

***Status**

FE = Federally listed as Endangered
FT = Federally listed as Threatened
FC = Federal Candidate Species
CE = State listed as Endangered
CT = State listed as Threatened
CR = State designated as Rare
CSC = California Species of Concern

CNPS 1b = Plants that are rare, threatened or endangered in California and elsewhere
CNPS 2 = Plants that are rare, threatened, or endangered in California but common elsewhere
CNPS 3 = Plants about which we need more information – review list
CNPS 4 = Plants of limited distribution – watch list

Table 4.3.B: Special-Status Wildlife Species Evaluated at the Sir Francis Drake Improvement Project Site, Marin County, California

Species	Status* (Federal/State /CNPS)	Habitat Requirements	Potential Habitat Present/Observed or Documented within the Project Study Area
Invertebrates			
Callophrys mossii marinensis Marin elfin butterfly	--/--	Found only in the redwood forest areas of Marin County. Larvae collected and reared on *Sedum spathulifolium*. Normal flight occurs in April.	Yes/Yes
Ischnura gemina San Francisco forktail damselfly	--/--	Endemic to the San Francisco Bay area. Found within small, marshy ponds and ditches with emergent and floating aquatic vegetation.	Yes/No
Lichnanthe ursine Bumblebee scarab beetle	--/--	Inhabits coastal sand dunes from Sonoma County south to San Mateo County. Usually flies close to sand surface near the crest of dunes.	No/No
Speyeria zerene myrtleae Myrtle's silverspot butterfly	FE/--	Found in coastal bluff scrub, coastal prairie terraces, and associated non-native grasslands in western Marin and southwestern Sonoma Counties. Adult butterflies are typically found in areas that are sheltered from the wind, below 820 feet elevation, and within 3 miles of the coast.	Yes/No
Syncaris pacifica California freshwater shrimp	FE/CE	Endemic to Marin, Napa, and Sonoma Counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy. Found in shallow pools away from main streamflow. In winter, found near undercut banks with exposed roots. In summer, found near leafy branches touching water.	Yes/Yes
Vespericola marinensis Marin hesperian	--/--	Found in moist spots in coastal brush fields and chaparral vegetation in Marin County. Found under leaves of cow parsnip, around spring seeps, in leafmold along streams, in alder woods, and mixed evergreen forest.	Yes/Yes
Birds			
Charadrius alexandrinus nivosus Western snowy plover	FT/CSC	Nests on sandy beaches, salt pond levees, and shores of large alkali lakes. Require sandy, gravelly or friable soils for nesting.	No/No
Dendroica petechia brewsteri Yellow warbler	--/CSC	Associated with riparian plant associations. Prefer willows, cottonwoods, aspens, sycamores, and alders for nesting and foraging activities. Also nest in montane shrubbery in open conifer forests.	Yes/No
Geothlypis trichas sinuosae Saltmarsh common yellowthroat	--/CSC	Resident of the San Francisco Bay region in coastal riparian and wetland areas of western Marin Co. and San Mateo County and tidal marsh and adjacent habitats around San Pablo Bay and southern San Francisco Bay. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, and willows for nesting.	No/No

Species	Status* (Federal/State /CNPS)	Habitat Requirements	Potential Habitat Present/Observed or Documented within the Project Study Area
Haliaeetus leucocephalus Bald eagle	FT/CE, Fully Protected	Nests and winters near ocean shores, lake margins and rivers. Nests in large, old-growth, or dominant live trees with open branches, especially Ponderosa pine. Roosts communally in winter.	No/No
Laterellus jamaicensis coturniculus California black rail	--/CT, Fully Protected	Mainly inhabits salt-marshes bordering larger bays. Occurs in tidal salt-marsh heavily grown to pickleweed. Also found in freshwater and brackish marshes.	No/No
Melospiza melodia samuelis San Pablo song sparrow	--/CSC	Resident of salt marshes along the north side of San Francisco and San Pablo Bays. Inhabits tidal sloughs in *Salicornia* marshes; nests in *Grindelia* bordering slough channels.	No/No
Pandion haliaetus Osprey	--/CSC	Nests along ocean shores, bays, fresh water lakes, and larger streams. Build large nests in tree tops within 15 miles of good fish-producing body of water.	Yes/No
Pelecanus occidentalis californicus California brown pelican	FE/CE, Fully Protected	Breed in nesting colonies on islands without mammal predators. Typically build a nest of sticks on the ground. Dive from flight to capture surface-schooling marine fishes. In California, they feed primarily on Pacific mackerel, Pacific sardine and northern anchovy.	No/No
Sternula antillarum browni California least tern	FE/CE, Fully Protected	Nests along the coast from San Francisco Bay south to northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates such as sand beaches, alkali flats, land fills, and paved areas.	No/No
Brachyramphus marmoratus Marbled murrelet	FT/CE	Feed on fish and invertebrates in the nearshore marine environment, but fly up to 50 miles inland to nest in conifer forests. Murrelets utilize forests with mature- or old-growth characteristics, including large trees, a generous amount of canopy closure, and complex under- and overstory structure. Nest trees must have trunk or branch formations, such as large horizontal branches, that can serve as nest platforms.	Yes/No
Strix occidentalis caurina Northern spotted owl	FT/--	Northern spotted owls are very territorial and intolerant of habitat disturbance. They prefer old-growth forests with tree canopies that are high and open enough for the owls to fly between and underneath the trees. Preferred areas have large trees with broken tops, deformed limbs or large holes used as nesting sites. Each pair needs a large amount of land for hunting and nesting, and although they do not migrate, spotted owls may shift their range in response to seasonal changes that make hunting difficult.	Yes/Yes
Fish			

Species	Status* (Federal/State /CNPS)	Habitat Requirements	Potential Habitat Present/Observed or Documented within the Project Study Area
Eucyclogobius newberryi Tidewater goby	FE/CSC	Found in brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches. They require fairly still but not stagnant water and high oxygen levels.	No/No
Lavinia symmetricus Tomales roach	--/CSC	Streams tributary to Tomales Bay.	Yes/Yes
Oncorhynchus kisutch Central California Coast coho salmon Evolutionarily Significant Unit (ESU)	FE/CE	Coho salmon have an anadromous life cycle. They hatch in freshwater streams, migrate to live for two years in the ocean, and then return to spawn in freshwater, almost always returning to the same river in which they were born. Returning adults typically enter freshwater rivers in the late fall, and spawning occurs throughout the fall and winter. Eggs hatch in the early spring, and juveniles then live in the river-bottom gravel for 10 weeks before emerging. After maturing for about a year in freshwater, coho migrate downstream to coastal estuaries and enter the ocean in the spring.	Yes/Yes
Oncorhynchus mykiss irideus Central California Coast steelhead ESU	FT/--	Central California Coast steelhead have an anadromous life cycle. They hatch in freshwater streams, migrate to live up to 3 years in the ocean, and then return to breed, or spawn, in freshwater. Returning adults typically enter freshwater rivers to spawn from December through April. After hatching, the developing steelhead will remain in the gravel for another four to six weeks. Newly emerged fry move to shallow, protected areas of the stream (usually in the stream margins). Most juveniles can be found in riffles, although larger ones will move to pools or deep runs. After maturing for a period of 1 - 2 years in freshwater, steelhead migrate downstream to coastal estuaries and enter the ocean in the spring.	Yes/Yes
Oncorhynchus tshawytscha California Coastal chinook salmon ESU	FT/--	Chinook salmon have an anadromous life cycle. They hatch in freshwater streams, migrate to live up to 6 years in the ocean, and then return to spawn in freshwater. Returning adults typically enter freshwater rivers in the late fall and early winter. After feeding for up to 2 years in freshwater, chinook migrate downstream to coastal estuaries and enter the ocean in the spring. and early summer	Yes/No
Oncorhynchus keta Pacific Coast chum salmon ESU	--/CSC	Infrequently stray into Lagunitas Creek and spawning runs rarely occur; the creek is not believed to support a permanent population of this species.	Yes/Yes

Species	Status* (Federal/State /CNPS)	Habitat Requirements	Potential Habitat Present/Observed or Documented within the Project Study Area
Amphibians and Reptiles			
Clemmys marmorata marmorata Northwestern pond turtle	--/CSC	An aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Require basking sites and suitable upland habitat (sandy banks or grassy open fields) for egg-laying.	Yes/No
Rana draytonii California red-legged frog	FT/CSC	Red-legged frogs require aquatic habitat for breeding but also use a variety of other habitat types including riparian and upland areas. Adults often utilize dense, shrubby or emergent vegetation closely associated with deep-water pools with fringes of cattails and dense stands of overhanging vegetation such as willows.	Yes/Yes
Rana boylii Foothill yellow-legged frog	--/CSC	Found in partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg-laying. Require at least 15 weeks to attain metamorphosis.	Yes/Yes
Mammals			
Antrozous pallidus Pallid bat	--/CSC	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Yes/Yes
Aplodontia rufa phaia Point Reyes mountain beaver	--/CSC	Coastal area of Point Reyes in areas of springs or seepages. North-facing slopes of hills and gullies in areas overgrown with sword fern and thimbleberry.	Yes/No
Corynorhinus townsendii Townsend's big-eared bat	--/CSC	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Yes/Yes
Taxidea taxus American badger	--/CSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Require sufficient food, friable soils and open, uncultivated ground. Prey on burrowing rodents and dig their own burrows.	Yes/No

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CNPS 4 = Plants of limited distribution – watch list

Marin hesperian (*Vespericola marinensis*) may meet the definition of "rare" under Section 15380 of the CEQA guidelines, based on its relatively limited area of occurrence. Appropriate habitat for this terrestrial snail is present and this species has been documented in the project area.

Two of the invertebrate species evaluated are considered to have moderate potential to occur in the project study area. **Myrtle's silverspot butterfly** (*Speyeria zerene myrtleae*) is a federally Endangered species and **San Francisco forktail damselfly** (*Ischnura gemina*) may meet the definition of "rare" under Section 15380 of the CEQA guidelines, based on its relatively limited area of occurrence from Marin to Santa Cruz County. Potential habitat for both species occurs in the project study area; however, neither species has been documented as occurring within the project study area. Host plant for Myrtle's silverspot butterfly (western dog violet) was not identified in the project study area during field surveys.

Birds. Eleven special-status bird species were evaluated for their potential to occur in the project study area. Only three of the species have a high or moderate potential to occur in the project study area, as summarized below. One species with low potential to occur is also summarized below.

Federal and State Listed Bird Species:

Northern spotted owl (*Strix occidentalis caurina*) is a federal Threatened species with high potential to occur. This species generally inhabits older forested habitats because they contain the structural characteristics required for nesting, roosting, and foraging. However, in redwood forests along the coast range of California, northern spotted owls may be found in younger forest stands that contain structural characteristics of older forests. Potential breeding, foraging, and nesting habitats were observed in the project study area, both north and south of the project site. Four breeding territories of this species have been identified in Samuel P. Taylor State Park and the GGNRA south of the project study area by the CNDDB. No federal critical habitat for this species has been designated within the project study area.[7]

Marbled murrelet (*Brachyramphus marmoratus*) is a federal Threatened and California Endangered species with low potential to occur in the project study area. It is a small, robin-sized diving seabird that feeds primarily on fish and invertebrates in near-shore marine waters. It spends the majority of its time on the ocean, roosting and feeding, but comes inland up to 50 miles to nest in forest stands with old growth forest characteristics. These dense shady forests are generally characterized by large trees with large branches or deformities suitable for use as nest platforms. Murrelets nest in stands varying in size from several acres to thousands of acres; however, larger unfragmented stands of old growth appear to be the highest quality habitat for marbled murrelet nesting. This species is not known to nest in Marin County despite thorough surveys conducted previously;[27] however, potential nesting habitat appears to be present in the vicinity of the project study area. No federal critical habitat for this species has been designated within the project study area.[28]

[27] Shuford, W.D. 1993. The Marin County Breeding Bird Atlas: A Distribution and natural History of Coastal California Birds; and Nelson, S.K. 1997. Marbled Murrelet (*Brachyramphus marmoratus*) In The Birds of North America, No 276 (A. Poole and F. Gill, eds). The Academy of Natural Sciences, Philadelphia, PA, and the American Ornithologists' Union, Washington, D.C.
[28] United States Fish and Wildlife Service (USFWS). 2009. Website Address: http://sacramento.fws.gov/.

Other Special Status Bird Species:

Osprey (*Pandion haliaetus*) is a California Species of Special Concern with moderate potential to occur in the project study area. This species has not been documented as occurring within the project study area or project vicinity and no active or potential nest sites were observed during recent field surveys. However, breeding, foraging, and nesting habitat were observed in the project study area both north and south of the project site.

Yellow warbler (*Dendroica petechia brewsteri*) is a California Species of Special Concern with moderate potential to occur in the project study area. This species has not been documented within the project study area or project vicinity, and was not observed during recent field surveys. No active or potential nest sites were observed during surveys; however, breeding, foraging, and nesting habitat were observed along Lagunitas Creek, along other streams with riparian vegetation in the study area, and in montane and open conifer plant communities in the vicinity of stream courses.

Migratory Birds and Other Raptor Species. A number of common migratory avian species potentially nest and forage within various habitat types within the project study area. A number of migratory avian species were observed on the fly and foraging within the project study area during field surveys. Migratory avian species are protected under the Federal Migratory Bird Treaty Act (See Section 4.3.2) and under Sections 355 and 356 of the California Fish and Game Code. Impacts to actively nesting migratory avian species and their nests would be considered significant impacts.

A number of other raptor species potentially nest and forage within various habitat types within the project study area. Red-tailed hawks were observed on the fly and foraging within the project study area during field surveys. It is the policy of California Department of Fish and Game's (CDFG's) Fish and Game Commission to recognize that raptors, including vultures, hawks, eagles, falcons, kites, osprey, and owls, are part of California's native fauna; are integral to their ecosystems; and have intrinsic, ecological, scientific, educational, economic, and recreational value. This policy also recognizes that raptor populations and their habitat should be identified, monitored, maintained, restored, and enhanced, through research, management, and protection by CDFG and ensures that utilization of or impacts to any population of raptor species will not contribute to the species' depletion in the wild. Under Section 3503.5 of the CDFG code, the State prohibits the removal of raptor nests.

Fish. Six special-status fish species were evaluated for their potential to occur in the project study area. Of these species, five were identified as having moderate to high potential to occur because potential habitat is present in or near the project study area and/or the species has been documented in Lagunitas Creek.

Federal and State Listed Fish Species:

Central California Coast Evolutionarily Significant Unit (ESU)[29] coho salmon is a federal and state Endangered species that spawns in Lagunitas Creek in the project study area. Lagunitas Creek is designated Critical Habitat as well as Essential Fish Habitat (EFH) for Central California Coast coho salmon (see Section 4.3.2).[30]

Central California Coast coho salmon is an "anadromous" fish – i.e., it hatches in freshwater streams, migrates to live for two years in the ocean, and then returns to spawn in the same steam in which it was hatched. Returning adults typically enter freshwater rivers in the late fall, and spawning occurs throughout the fall and winter. Eggs hatch in the early spring, and juveniles then live in the bottom gravel of the stream for 10 weeks before emerging. After maturing for about a year in freshwater, coho migrate downstream to coastal estuaries and enter the ocean in the spring.

Central California Coast coho salmon have been well documented as an established population within Lagunitas Creek and several of its tributaries (see *Biological Assessment* – Appendix E). An average of 557 spawning coho and 230 redds[31] have been observed in Lagunitas Creek and its tributaries during annual Marin Municipal Water District (MMWD) surveys since 1994. As many as 1,342 spawners and 496 redds have been counted during these surveys.[32] However, these numbers are believed to be a significant reduction from historic populations in Lagunitas Creek, mirroring an overall population decline throughout the species' range. Despite the population declines, Lagunitas Creek is considered one of the highest quality stream reaches for Central California Coast coho salmon in the state of California and has one of the largest and most stable populations of this ESU.[3334]

A recent study commissioned by the Marin Resource Conservation District (MRCD) and others, indicates that a paucity of over-wintering habitat for juvenile salmon (*i.e.* low velocity off-channel areas such as floodplains, backwater channels and complex in-channel areas with large woody debris) may be a key limiting factor to salmonid populations in Lagunitas Creek.[35] The results of the MRCD study are reflected in the recently released National Marine Fisheries Service (NMFS) Draft Recovery Plan for Central California Coast coho salmon. The Recovery Plan provides a range of actions needed to restore populations of this species to self-sustaining

[29] NOAA defines an "ESU" as a population or group of populations that is substantially reproductively isolated from other populations of the same species and that represents an important component of the evolutionary legacy of the species. Under federal regulations (56 FR 58612) an ESU for Pacific salmon species is considered to be a distinct population segment (DPS), which may be listed under the ESA if believed to be in danger or extinction.
[30] NOAA Fisheries. 2009. Website address: www.nmfs.noaa.gov.
[31] "Redd" is the term used for the spawning nest in stream gravels into which the female salmon deposits its eggs.
[32] Marin Municipal Water District (MMWD). 2009. Lagunitas Creek Salmon Spawner Survey Report 2008-2009. Prepared by the MMWD Fishery Program staff, 220 Nallen Drive, Corte Madera, CA 94925. October 2009. 24 pages.
[33] Moyle, P., Israel, J., and S. Purdy. 2008. Salmon, Steelhead, and Trout in California: Status of an Emblematic Fauna. Report prepared by Center for Watershed Sciences, University of California, Davis. Report commissioned by California Trout. 316 pages.
[34] Marin Municipal Water District (MMWD). 2009. Lagunitas Creek Salmon Spawner Survey Report 2008-2009. Prepared by the MMWD Fishery Program staff, 220 Nallen Drive, Corte Madera, CA 94925. October 2009. 24 pages.
[35] Stillwater Sciences. 2008. Lagunitas limiting factors analysis: limiting factors for coho salmon and steelhead. Final Report. Prepared for the Marin Resource Conservation District, Point Reyes Station, California. 72pp. + Appends.

levels, including several specific high priority actions for Lagunitas Creek and its tributaries.[36] Several of these actions are particularly relevant to the proposed project in the context of impact avoidance and possible mitigation, including the following: (1) increase the frequency and functionality of off-channel habitats, (2) increase the amount of large wood in the stream, and (3) reduce impacts from existing roads.

Central California Coast steelhead ESU is a federal Threatened species that spawns in Lagunitas Creek in the project study area. Lagunitas Creek is also designated Critical Habitat for steelhead. EFH has not been designated for this species in the project study area.[37]

Central California Coast steelhead is an anadromous fish that spawns in freshwater streams, migrates to live for up to three years in the ocean, and then returns to spawn in the same stream in which it was hatched. Returning adults typically enter freshwater rivers in the late fall and spring to spawn. Eggs hatch in the early spring, and juveniles then live in the bottom gravel of the stream for 2 - 5 weeks before emerging. After maturing for up to two years in freshwater, steelhead migrate downstream to coastal estuaries and enter the ocean in the spring and early summer.

Central California Coast steelhead have been well documented as an established population within Lagunitas Creek and several of its tributaries (see *Biological Assessment* – Appendix E). An average of 121 spawning steelhead and 97 redds have been observed in Lagunitas Creek and its tributaries during annual MMWD surveys since 1994. As many as 588 spawners and 303 redds have been counted during these surveys.[38] These numbers are believed to be a significant reduction from historic populations in Lagunitas Creek, mirroring an overall population decline throughout the species' range (see *Biological Assessment* – Appendix E).

The MRCD study discussed above addressed both coho salmon and steelhead.[39] The study indicated that a paucity of over-wintering habitat appears to not only limit coho populations but also may limit steelhead populations in Lagunitas Creek. Mitigation actions that restore and improve such over-wintering habitat for coho salmon could also benefit steelhead.

California Coastal chinook salmon ESU is a federal Threatened species that spawns in Lagunitas Creek in the project study area. Designated Critical Habitat for this species does not include Lagunitas Creek; EFH has not been designated for this species in the project study area.[12]

California Coastal chinook salmon is an anadromous fish that hatches in freshwater streams, migrates to live for up to six years in the ocean, and then returns to spawn in the same stream in which it was hatched. Returning adults typically enter freshwater rivers in the fall and early winter to spawn (although the species also has historically had spawning runs in the spring). After hatching and emergence, juveniles mature for up to two years in freshwater, steelhead migrate downstream to coastal estuaries and enter the ocean in the spring and early summer.

[36] ftp.afsc.noaa.gov/SWR/Public/Public draft recovery plan CCC coho salmon/
[37] NOAA Fisheries. 2009. Website address: www.nmfs.noaa.gov.
[38] Marin Municipal Water District (MMWD). 2009. Lagunitas Creek Salmon Spawner Survey Report 2008-2009. Prepared by the MMWD Fishery Program staff, 220 Nallen Drive, Corte Madera, CA 94925. October 2009. 24 pages.
[39] Stillwater Sciences. 2008. Lagunitas limiting factors analysis: limiting factors for coho salmon and steelhead. Final Report. Prepared for the Marin Resource Conservation District, Point Reyes Station, California. 72pp. + Appends.

California Coastal chinook salmon have been documented to have a small population within Lagunitas Creek (see *Biological Assessment* – Appendix E). An average of 26 spawning chinook and 22 redds have been observed in Lagunitas Creek and its tributaries during annual MMWD surveys since 1994.[40]

Other Special Status Fish Species:

Tomales roach (*Lavinia symmetricus*) is a California Species of Special Concern that has been documented in Lagunitas Creek in the project study area. The species is generally found in small, warm, intermittent streams; dense populations are frequently found in isolated pools.

Pacific Coast Chum salmon ESU is a California Species of Special Concern that has been documented to occasionally occur in Lagunitas Creek. This ESU is not federally listed because the NMFS has determined that the species is not presently at risk of extinction nor likely to become so. Although Pacific Coast chum salmon appear to infrequently stray into Lagunitas Creek and spawning runs rarely occur, the creek is not believed to support a permanent population of this species (Greg Andrew, MMWD *pers. com.*).

Amphibians and Reptiles. Three species of amphibians and reptiles were evaluated for their potential to occur in the project study area, and all three were determined to have a high to moderate potential.

Federal and State Listed Amphibians and Reptiles:

California red-legged frog (*Rana aurora draytonii*) is a federal Threatened species and a California Species of Special Concern. This species is known and documented to occur in Lagunitas Creek in the project study area, and has been documented in San Geronimo Creek to the east of the project study area.[41] Suitable breeding, foraging, and aestivation habitats for this species were observed in and near the project study area. The project study area does not occur within federal critical habitat for this species. The nearest Critical Habitat for this species is located approximately 0.5 miles to the west of the project study area.[42]

Other Special Status Amphibians and Reptiles:

Foothill yellow-legged frog is a California Species of Special Concern that is known and documented to occur in San Geronimo Creek near Shafter Bridge to the east of the project study area.[9]

Northwestern pond turtle (*Actinemys marmorata marmorata*) is a California Species of Special Concern that has not been documented to occur in the project study area; however, appropriate

[40] Marin Municipal Water District (MMWD). 2009. Lagunitas Creek Salmon Spawner Survey Report 2008-2009. Prepared by the MMWD Fishery Program staff, 220 Nallen Drive, Corte Madera, CA 94925. October 2009. 24 pages.
[41] CDFG (California Department of Fish and Game). 2009. California Natural Diversity Database. Rare Find 3, Version 3.0.5. Habitat Planning and Conservation Branch. Electronic Database.
[42] USFWS (U.S. Fish and Wildlife Service). 2010. Endangered and Threatened Wildlife and Plants; revised Designation of Critical Habitat for the California Red-legged Frog. 50 CFR Part 17. Federal Register Vol 75, No. 51: 12816-12959.

foraging, breeding, nesting, basking, and wintering habitat for this species is present in Lagunitas Creek and upland habitat areas adjacent to the project site.

Mammals. Four special-status mammal species were evaluated for their potential to occur in the project study area. All four species were determined to have high to moderate potential to occur.

Pallid bat (*Antrozous pallidus*) and **Townsend's big-eared bat** (*Corynorhinus townsendii*) are two California Species of Special Concern that have been documented near a bridge at the western end of the project site near the intersection of SFDB and Platform Bridge Road.[43] Appropriate foraging, nesting, roosting and breeding habitats for these species are present within the project study area.

American badger (*Taxidea taxus*) is a California Species of Special Concern with a moderate potential to occur in the project study area. This species has not been documented within the project study area or project vicinity and was not observed during recent field surveys. Appropriate nesting dens were not observed, nor was any evidence of badger digs found; however, potential habitat for this species is present within the project study area.

Point Reyes mountain beaver (*Aplodontia rufa phaea*) is a California Species of Special Concern with low potential to occur in the project study area. This small burrowing mammal utilizes sheltered gulches on steep, north-facing slopes under dense stands of vegetation where soil conditions and drainage aid burrowing. Coastal scrub dominated by salmonberry, coyote brush, poison oak, and cow parsnip is a common habitat used by this species. It utilizes habitat that is located adjacent to perennial streams that supports riparian vegetation.[44]

The *Biological Assessment* (Appendix E) states that presence of this species in the project vicinity is historically indicated by two museum specimens (one recorded in CNDDB). Exact locations of the specimen collections are unknown. The *Biological Assessment* also refers to a sighting of the species east of the project site near Shafter Bridge, recorded in 1898. No occurrences of this species more recent than 1898 have been recorded in the CNDDB and no evidence of mountain beaver activity was found in the project study area during field surveys. Based on the history of this species in the general project vicinity, the age of the CNDDB record for the only sighting in the project study area, and the apparent lack of evidence of its presence during biological surveys conducted in the project study area, this species is assumed to be absent from the project study area and vicinity.

Wetland and Streams

A delineation of wetlands and watercourses within the project study area was conducted by Synthesis Environmental Planning in 2007.[45] The study documented 29 individual wetlands and 32 streams within the current roadway right-of-way, or 30 feet on either side of the centerline of the existing roadway. The 29 wetland areas together encompass 0.94 acre, consisting largely of roadside swales

[43] CDFG (California Department of Fish and Game). 2009. California Natural Diversity Database. Rare Find 3, Version 3.0.5. Habitat Planning and Conservation Branch. Electronic Database.
[44] CDFG (California Department of Fish and Game). 2009. Website address: www.dfg.ca.gov.
[45] Synthesis Environmental Planning, 2009. Wetland Delineation of the Sir Francis Drake Boulevard Rehabilitation Project, Marin County, California. Unpublished report. Prepared for Marin County Department of Public Works. July.

with seasonal wetland vegetation. The 32 streams total 0.39 acre and consist entirely of those portions of Lagunitas Creek tributaries that pass beneath SFDB through culverts within the 30-foot zone from the road centerline. There are 6 perennial streams, 9 intermittently flowing streams and 17 ephemerally flowing streams that flow through culverts beneath SFDB.

4.3.2 Regulatory Framework

A large number of plans, policies, and regulations apply to biological resources on and in the vicinity of the project site. Starting at the federal level followed by State, regional, and local levels, this regulatory context is described below.

Applicable Federal Laws and Regulations. The following federal laws and regulations apply to the proposed project.

Endangered Species Act (ESA): The United States Fish and Wildlife Service (USFWS) has jurisdiction over terrestrial and freshwater species that are formally listed as Threatened or Endangered under the federal ESA. The National Marine Fisheries Service (NMFS) has jurisdiction over listed marine species, which include anadromous fish such as salmon.

The ESA protects listed wildlife species from harm or "take." The term "take" is broadly defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." An activity is defined as a "take" even if it is unintentional or accidental. An Endangered plant or wildlife species is one that is considered in danger of becoming extinct throughout all, or a significant portion of its range. A Threatened species is one that is likely to become endangered within the foreseeable future. In addition to Endangered and Threatened species, which are legally protected under the federal ESA, the USFWS has a list of proposed and candidate species. Proposed species are those for which a proposed rule to list them as Endangered or Threatened has been published in the Federal Record. A candidate species is one for which the USFWS currently has enough information to support a proposal to list it as a Threatened or Endangered species. These latter species are not afforded legal protection under the federal ESA. Nonetheless, project-related impacts to federally-listed, proposed, and candidate species or their habitats are considered "significant" under *CEQA Guidelines* (discussed below).

Critical habitat is defined under the ESA as a specific geographic area(s) within a listed species' range that contains features considered essential for the conservation of the listed species. Designated critical habitat for a given species may not necessarily be currently occupied by that species, if it is within the historic range of the species and supports habitat deemed by the USFWS to be important for the recovery of the species. Critical habitat designation applies only to federal actions or actions funded or permitted by federal agencies. If a federal action or an action allowed by federal funding or a federal permit has the potential to adversely affect critical habitat for a listed species, the responsible federal agency is required to consult with the USFWS or NMFS. The project study area contains designated critical habitat for Central California Coast coho salmon ESU and Central California Coast steelhead ESU.

Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA): The National Oceanic and Atmospheric Administration Marine Fisheries Service (NOAA Fisheries or NMFS) is responsible for managing Essential Fish Habitat (EFH) as designated under the Magnuson-Stevens Fishery

Conservation and Management Act (MSFCMA). EFH is broadly defined to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity," and requires Fishery Management Councils (FMC) to describe and identify the essential habitat for the managed species, minimize to the extent practicable adverse effects on EFH caused by fishing, and identify other actions to encourage the conservation and enhancement of EFH. The MSFCMA also establishes measures to protect EFH. NMFS must coordinate with other federal agencies to conserve and enhance EFH, and federal agencies must consult with NOAA on all actions or proposed actions authorized, funded, or undertaken by the agency that may adversely affect EFH. In turn NOAA must provide recommendations to federal and state agencies (including CDFG and the Regional Water Quality Control Board [RWQCB]) on such activities to conserve EFH. These recommendations may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from actions or proposed actions authorized, funded, or undertaken by that agency.

Clean Water Act: Under Section 404 of the Clean Water Act (CWA), the United States Army Corps of Engineers (Corps) is responsible for regulating the discharge of fill material into waters of the U.S. Waters of the United States (U.S.) and their lateral limits are defined in 33 Code of Federal Regulations (CFR) Part 328.3(a) and include streams that are tributary to navigable waters and their adjacent wetlands. Wetlands that are not adjacent to waters of the U.S. are termed “isolated wetlands” and may not be subject to Corps jurisdiction.

In general, a Corps permit must be obtained before placing fill in wetlands or other waters of the U.S. The type of permit required depends on the amount of acreage and the purpose of the proposed fill, and is subject to discretion from the Corps. The two categories of Corps permits are: nationwide (general) permits and individual permits. To qualify for a nationwide permit, a project must demonstrate that it has no more than a minimal adverse effect on an aquatic ecosystem. The Corps typically interprets this condition to mean that there will be no net loss of either habitat acreage or habitat value. This usually results in the need to provide mitigation for project-related fill of any waters of the U.S.

An individual permit is required where a nationwide permit is not applicable. The consideration of an individual permit includes, but is not limited to, factors such as significant acreage of wetlands or waters of the U.S., areas of high or unique biological value, or length of watercourse affected. Individual permits require review of the project by the public, evidence that wetland impacts have been avoided or minimized to the extent possible, and provision of appropriate compensatory mitigation for unavoidable impacts.

Migratory Bird Treaty Act: The Migratory Bird Treaty Act (16 USC 703) prohibits the taking, hunting, killing, selling, purchasing, etc. of migratory birds, parts of migratory birds, or their eggs and nests. In addition, it contains a clause that prohibits baiting or poisoning of these birds. As used in this act, the term “take” is defined as meaning, “to pursue, hunt, shoot, capture, collect, kill, or attempt to pursue, hunt, shoot, capture, collect, or kill, unless the context otherwise requires.” Most of the native bird species that occur in the vicinity of the project study area are covered by this act.

Applicable State Laws and Regulations. The following State laws and regulations apply to the proposed project.

California Endangered Species Act: The CDFG has jurisdiction over state-listed Rare plants, and Threatened and Endangered plant and animal species under the California Endangered Species Act. In addition, its provisions protect species proposed for listing under the State Act.

California Department of Fish and Game Species of Special Concern: The CDFG also maintains informal lists of "species of special concern." These species are broadly defined as plants and animals that are of concern to CDFG because of population declines and restricted distributions, and/or they are associated with habitats that are declining in California. Project-related impacts to species of special concern are considered "significant" under *CEQA Guidelines* (discussed below).

California Department of Fish and Game Code: The following sections of the CDFG Code apply to the proposed project:

- *California Fully Protected and Protected Species.* California fully protected and protected species may not be taken or possessed without a permit from the Fish and Game Commission and/or the CDFG. These take permits do not allow "incidental take," except in limited circumstances, and are more restrictive than the take allowed under Section 2081 for the California Endangered Species Act. Information on fully protected species can be found in the Fish and Game Code (birds at Section 3511, mammals at Section 4700, reptiles and amphibians at Section 5050, and fish at Section 5515). Information on protected (as opposed to fully protected) amphibians can be found in Chapter 5, Section 41; protected (as opposed to fully protected) reptiles at Chapter 5, Section 42.
- *California Fish and Game Code Sections 3503, 3503.5, and 3513.* The CDFG Code (cited sections) protects the nests and eggs of birds, including raptors (Falconiformes and Strigiformes) and the migratory bird species protected under the Migratory Bird Treaty Act.
- *California Fish and Game Code Section 1600.* The CDFG also administers the issuance of Streambed Alteration Agreements under the CDFG Code Section 1600. Streambed Alteration Agreements are required any time project activities would substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated as such by CDFG.

Section 401 Water Quality Certification: Pursuant to Section 401 of the federal CWA, projects that require a permit from the Corps under Section 404 must also obtain Water Quality Certification from the California Regional Water Quality Control Board (RWQCB). This regulatory program is administered by one of nine Regional Boards depending on project location. The RWQCB has adopted a policy requiring mitigation for any loss of wetland, streambed, or jurisdictional area.

Porter-Cologne Water Quality Act: Wetlands and other waters may also be subject to regulation by the State under the Porter-Cologne Water Quality Act. The RWQCB has provisionally agreed to use published federal CWA criteria to define the extent of State Waters. State jurisdiction, however, is ultimately determined by the RWQCB and may differ from CWA jurisdiction at their discretion. One clear difference is that RWQCB jurisdiction under the Porter-Cologne Water Quality Act extends to isolated waters.

CEQA Guidelines Section 15380: Although Threatened and Endangered species are protected by specific federal and State statutes, *CEQA Guidelines* Section 15380(b) provides that a species not listed on the federal or State list of protected species may be considered Rare or Endangered if the

species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in the federal Endangered Species Act and the section of the California Fish and Game Code dealing with Rare or Endangered species. Section 15380 (b) was included in the guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on a species that has not yet been listed by either the USFWS or CDFG. Thus, CEQA provides a lead agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

The California Native Plant Society (CNPS), a non-governmental conservation organization, has developed lists of plants of special concern in California. A CNPS List 1A plant is a species, subspecies, or variety that is considered to be extinct. A List 1B plant is considered Rare, Threatened, or Endangered in California and elsewhere. A List 2 plant is considered Rare, Threatened, or Endangered in California but is more common elsewhere. A List 3 plant is a species for which CNPS lacks necessary information to determine if it should be assigned to a list or not. A List 4 plant has a limited distribution in California.

All of the plant species on List 1 and List 2 meet the requirements of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the CDFG Code, and are eligible for State listing. Therefore, plants appearing on Lists 1 or 2 are considered to meet CEQA's Section 15380 criteria and effects to these species are considered "significant" in this document.

Marin Countywide Plan. The Marin CWP is a comprehensive plan for the development and use of land in the County and is an expression of community values. The Marin CWP was adopted by the Board of Supervisors on November 6, 2007. The CWP serves as the comprehensive guide for making decisions about land use, economic development, road improvements, and protection of natural resources and public health and safety. It also provides the legal foundation for all zoning, subdivision and public facilities ordinances, decisions, and projects.

Policies throughout the CWP emphasize the value of protecting and preserving the natural resources of the County. Policies relevant to the biological resources of the project site include:

Goal BIO-1: Enhanced Native Habitat and Biodiversity. Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout the County.

Policy BIO-1.1: Protect Wetlands, Habitat for Special-Status Species, Sensitive Natural Communities, and Important Wildlife Nursery Areas and Movement Corridors. Protect sensitive biological resources, wetlands, migratory species of the Pacific flyway, and wildlife movement corridors through careful environmental review of proposed development applications, including consideration of cumulative impacts, participation in comprehensive habitat management programs with other local and resource agencies, and continued acquisition and management of open space lands that provide for permanent protection of important natural habitats.

Policy BIO-1.3: Protect Woodlands, Forests, and Tree Resources. Protect large native trees, trees with historical importance; oak woodlands; healthy and safe eucalyptus groves that support colonies of

monarch butterflies, colonial nesting birds, or known raptor sites; and forest habitats. Prevent the untimely removal of trees through implementation of standards in the Development Code and the Native Tree Preservation and Protection Ordinance. Encourage other local agencies to adopt tree preservation ordinances to protect native trees and woodlands, regardless of whether they are located in urban or undeveloped areas. See also Policy SV-1.7

Goal BIO-2: Protection of Sensitive Biological Resources. Require identification of sensitive biological resources and commitment to adequate protection and mitigation, and monitor development trends and resource preservation efforts.

Policy BIO-2.1: Include Resource Preservation in Environmental Review. Require environmental review pursuant to CEQA of development applications to assess the impact of proposed development on native species and habitat diversity, particularly special-status species, sensitive natural communities, wetlands, and important wildlife nursery areas and movement corridors. Require adequate mitigation measures for ensuring the protection of any sensitive resources and achieving "no net loss" of sensitive habitat acreage, values, and function.

Policy BIO-2.2: Limit Development Impacts. Restrict or modify proposed development in areas that contain essential habitat for special-status species, sensitive natural communities, wetlands, baylands and coastal habitat, and riparian habitats, as necessary to ensure the continued health and survival of these species and sensitive areas. Development projects should preferably be modified to avoid impacts on sensitive resources, or to adequately mitigate impacts by providing on-site or (as a lowest priority) off-site replacement at a higher ratio.

Policy BIO-2.3: Preserve Ecotones. Condition or modify development permits to ensure that ecotones, or natural transitions between habitat types, are preserved and enhanced because of their importance to wildlife. Ecotones of particular concern include those along the margins of riparian corridors, baylands and marshlands, vernal pools, and woodlands and forests where they transition to grasslands and other habitat types.

Policy BIO-2.4: Protect Wildlife Nursery Areas and Movement Corridors. Ensure that important corridors for wildlife movement and dispersal are protected as a condition of discretionary permits, including consideration of cumulative impacts. Features of particular importance to wildlife for movement may include riparian corridors, shorelines of the coast and bay, and ridgelines. Linkages and corridors shall be provided that connect sensitive habitat areas such as woodlands, forests, wetlands, and essential habitat for special-status species, including an assessment of cumulative impacts.

Policy BIO-2.5: Restrict Disturbance in Sensitive Habitat During Nesting Season. Limit construction and other sources of potential disturbance in sensitive riparian corridors, wetlands, and baylands to protect bird nesting activities. Disturbance should generally be set back from sensitive habitat during the nesting season from March 1 through August 1 to protect bird nesting, rearing, and fledging activities. Preconstruction surveys should be conducted by a qualified professional where development is proposed in sensitive habitat areas during the nesting season, and appropriate restrictions should be defined to protect nests in active use and ensure that any young have fledged before construction proceeds.

Policy BIO-2.6: Identify Opportunities for Safe Wildlife Movement. Ensure that existing stream channels and riparian corridors continue to provide for wildlife movement at roadway crossings, preferably through the use of bridges, or through over-sized culverts, while maintaining or restoring a natural channel bottom. Consider the need for wildlife movement in designing and expanding major roadways and other barriers in the county. Of particular concern is the possible widening of Highway 101 north of Novato to the county line, where maintenance of movement opportunities for terrestrial wildlife between the undeveloped habitat on Mount Burdell and the marshlands along the Petaluma River is critical.

Policy BIO-2.8: Coordinate with Trustee Agencies. Consult with trustee agencies (the California Department of Fish and Game, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration Fisheries, U.S. Army Corps of Engineers, Environmental Protection Agency, Regional Water Quality Control Board, and Bay Conservation and Development Commission) during environmental review when special-status species, sensitive natural communities, or wetlands may be adversely affected.

Policy BIO-2.9: Promote Early Consultation with Other Agencies. Require applicants to consult with all agencies with review authority for projects in areas supporting wetlands and special-status species at the outset of project planning.

> *Program BIO-2.a: Require Site Assessments.* Require site assessment by a qualified professional for development applications that may adversely affect sensitive biological or wetland resources, including jurisdictional wetlands, occurrences of special-status species, occurrences of sensitive natural communities, and important wildlife nursery areas and movement corridors. The assessment should determine the presence or absence of any sensitive resources that could be affected by development, evaluate the potential impacts, and identify measures for protecting the resource and surrounding habitat. Require the assessment to be conducted by a qualified professional paid for by the applicant. Unless waived, the qualified professional should be hired directly by Marin County.

Goal BIO-3: Wetland Conservation. Require all feasible measures to avoid and minimize potential adverse impacts on existing wetlands and to encourage programs for restoration and enhancement of degraded wetlands.

Policy BIO-3.1: Protect Wetlands. Require development to avoid wetland areas so that the existing wetlands and upland buffers are preserved and opportunities for enhancement are retained (areas within setbacks may contain significant resource values similar to those within wetlands and also provide a transitional protection zone).

Establish a Wetland Conservation Area (WCA) for jurisdictional wetlands to be retained, which includes the protected wetland and associated buffer area. Development shall be set back a minimum distance to protect the wetland and provide an upland buffer. Larger setback standards may apply to wetlands supporting special-status species or associated with riparian systems and baylands under tidal influence, given the importance of protecting the larger ecosystems for these habitat types as called for under Stream Conservation and Baylands Conservation policies defined in Policy BIO-4.1 and BIO-5.1, respectively. Regardless of parcel size, a site assessment is required either where

incursion into a WCA is proposed or where full compliance with all WCA criteria would not be met. Employ the following criteria when evaluating development projects that may impact wetland areas:

Coastal, Inland Rural, and Baylands Corridors: For all parcels, provide a minimum 100-foot development setback from wetlands (areas within setbacks may contain significant resource values similar to those within wetlands and also provide a transitional protection zone). An additional buffer may be required, based on the results of a site assessment, if such an assessment is determined to be necessary. Site assessments will be required and conducted pursuant to Program BIO-3.c, Require Site Assessment. Exceptions to full compliance with the WCA setback standards may apply only in the following cases:

1. Parcel is already developed with an existing use, provided no unauthorized fill or other modifications to wetlands have occurred as part of ongoing use of the property.
2. Parcel is undeveloped and falls entirely within the WCA.
3. Parcel is undeveloped and potential impacts on water quality, wildlife habitat, or other sensitive resources would be greater as a result of development outside the WCA than development within the WCA, as determined by a site assessment.
4. Wetlands are avoided and a site assessment demonstrates that minimal incursion within the minimum WCA setback distance would not result.

Policy BIO-3.2: Require Thorough Mitigation. Where avoidance of wetlands is not possible, require provision of replacement habitat on-site through restoration and/or habitat creation at a minimum ratio of 2 acres for each acre lost (2:1 replacement ratio) for on-site mitigation and a minimum 3:1 replacement ratio for off-site mitigation. Mitigation wetlands should be of the same type as those lost and provide habitat for the species that use the existing wetland. Mitigation should also be required for incursion within the minimum WCA setback/transition zone.

Program Bio-3.b: Comply with Regulations to Protect Wetlands. Continue to require development applications to include the submittal of a wetland delineation for sites with jurisdictional wetlands and to demonstrate compliance with these wetlands policies, standards, and criteria, and with State and federal regulations.

Program BIO-3.c: Require Site Assessment. Require development applications to include the submittal of a site assessment prepared by a qualified professional where incursions into the WCA are proposed, or adverse impacts to wetlands resources may otherwise occur. The assessment should be considered in determining whether any adverse direct or indirect impacts on wetlands would occur as a result of the proposed development, whether wetlands criteria and standards are being met, and to identify measures necessary to mitigate any significant impacts. The site assessment may also serve as a basis for the County to apply restrictions in addition to those required by State and federal regulations. The site assessment shall be paid for by the applicant. Unless waived, the qualified professional shall be hired directly by Marin County.

Goal BIO-4: Riparian Conservation. Protect and, where possible, restore the natural structure and function of riparian systems.

Policy BIO-4.1: Restrict Land Use in Stream Conservation Areas. A Stream Conservation Area (SCA) is established to protect the active channel, water quality and flood control functions, and

associated fish and wildlife habitat values along streams. Development shall be set back to protect the stream and provide an upland buffer, which is important to protect significant resources that may be present and provides a transitional protection zone. Best management practices1 shall be adhered to in all designated SCAs. Best management practices are also strongly encouraged in ephemeral streams not defined as SCAs.

Exceptions to full compliance with all SCA criteria and standards may be allowed only if the following is true: 1) A parcel falls entirely within the SCA; or 2) Development on the parcel entirely outside the SCA either is infeasible or would have greater impacts on water quality, wildlife habitat, other sensitive biological resources, or other environmental constraints than development within the SCA. SCAs are designated along perennial, intermittent, and ephemeral streams as defined in the Countywide Plan Glossary. Regardless of parcel size, a site assessment is required where incursion into an SCA is proposed or where full compliance with all SCA criteria would not be met. An ephemeral stream is subject to the SCA policies if it: (a) supports riparian vegetation for a length of 100 feet or more, and/or (b) supports special-status species and/or a sensitive natural community type, such as native grasslands, regardless of the extent of riparian vegetation associated with the stream. For those ephemeral streams that do not meet these criteria, a minimum 20-foot development setback should be required.

SCAs consist of the watercourse itself between the tops of the banks and a strip of land extending laterally outward from the top of both banks to the widths. The SCA encompasses any jurisdictional wetland or unvegetated other waters within the stream channel, together with the adjacent uplands, and supersedes setback standards defined for WCAs. Human-made flood control channels under tidal influence are subject to the Bayland Conservation policies. The following criteria shall be used to evaluate proposed development projects that may impact riparian areas:

Coastal, Inland Rural, and Baylands Corridors: For all parcels, provide a development setback on each side of the top of bank that is the greater of either (a) 50 feet landward from the outer edge of woody riparian vegetation associated with the stream or (b) 100 feet landward from the top of bank. An additional setback distance may be required based on the results of a site assessment. A site assessment may be required to confirm the avoidance of woody riparian vegetation and to consider site constraints, presence of other sensitive biological resources, options for alternative mitigation, and determination of the precise setback. Site assessments will be required and conducted pursuant to Program BIO-4.g, Require Site Assessment. .

Allowable uses in SCAs in any corridor consist of the following, provided they conform to zoning and all relevant criteria and standards for SCAs:

- Existing permitted or legal nonconforming structures or improvements, their
- repair, and their retrofit within the existing footprint;
- Projects to improve fish and wildlife habitat;
- Driveway, road and utility crossings, if no other location is feasible;
- Water-monitoring installations;
- Passive recreation that does not significantly disturb native species;
- Necessary water supply and flood control projects that minimize impacts to stream function and to fish and wildlife habitat;
- Agricultural uses that do not result in any of the following:

a. The removal of woody riparian vegetation;
b. The installation of fencing within the SCA that prevents wildlife access to the riparian habitat within the SCA;
c. Animal confinement within the SCA; and
d. A substantial increase in sedimentation.

Policy BIO-4.2: Comply with SCA Regulations. Implement established setback criteria for protection of SCAs through established discretionary permit review processes and/or through adoption of new ordinances. Environmental review shall be required where incursion into an SCA is proposed and a discretionary permit is required. In determining whether allowable uses are compatible with SCA regulations, development applications shall not be permitted if the project does any of the following:

- Adversely alters hydraulic capacity;
- Causes a net loss in habitat acreage, value, or function;
- Degrades water quality.

Policy BIO-4.4: Promote Natural Stream Channel Function. Retain and, where possible, restore the hydraulic capacity and natural functions of stream channels in SCAs. Discourage alteration of the bed or banks of the stream, including filling, grading, excavating, and installation of storm drains and culverts. When feasible, replace impervious surfaces with pervious surfaces. Protect and enhance fish habitat, including through retention of large woody debris, except in cases where removal is essential to protect against property damage or prevent safety hazards. In no case shall alterations that create barriers to fish migration be allowed on streams mapped as historically supporting salmonids. Alteration of natural channels within SCAs for flood control should be designed and constructed in a manner that retains and protects the riparian vegetation, allows for sufficient capacity and natural channel migration, and allows for reestablishment of woody trees and shrubs without compromising the flood flow capacity where avoidance of existing riparian vegetation is not possible.

Policy BIO-4.5: Restore and Stabilize Stream Channels. Pursue stream restoration and appropriate channel redesign where sufficient right-of-way exists that includes the following: a hydraulic design, a channel plan form, a composite channel cross-section that incorporates low flow and bankfull channels, removal and control of invasive exotic plant species, and biotechnical bank stabilization methods to promote quick establishment of riparian trees and other native vegetation.

Policy BIO-4.7: Protect Riparian Vegetation. Retain riparian vegetation for stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.

Policy BIO-4.14: Reduce Road Impacts in SCAs. Locate new roads and roadfill slopes outside SCAs, except at stream crossings, and consolidate new road crossings wherever possible to minimize disturbance in the SCA. Require spoil from road construction to be deposited outside the SCA, and take special care to stabilize soil surfaces.

Policy BIO-4.15: Reduce Wet Weather Impacts. Ensure that development work adjacent to and potentially affecting SCAs is not done during the wet weather or when water is flowing through streams, except for emergency repairs, and that disturbed soils are stabilized and replanted, and areas

where woody vegetation has been removed are replanted with suitable species before the beginning of the rainy season.

Policy BIO-4.20: Minimize Runoff. In order to decrease stormwater runoff, the feasibility of developing a peak stormwater management program shall be evaluated to provide mitigation opportunities such as removal of impervious surface or increased stormwater detention in the watershed.

Program BIO-4.f: Identify Potential Impacts to Riparian Systems. At the time of a development application, evaluate potential impacts on riparian vegetation and aquatic habitat, and incorporate measures to protect riparian systems into the project design and construction. Retain and minimize disturbance to woody and herbaceous riparian vegetation in SCAs and adjacent areas. Tree growth may be cleared from the stream channel where removal is essential to protect against property damage or prevent safety hazards.

Program BIO-4.g: Require Site Assessment. Require development applications to include the submittal of a site assessment prepared by a qualified professional where incursions into the SCA are proposed, or adverse impacts to riparian resources may otherwise occur. Unless waived, the qualified professional shall be hired by Marin County. The site assessment shall be paid for by the applicant and considered in determining whether any adverse direct or indirect impacts on riparian resources would occur as a result of the proposed development, whether SCA criteria and standards are being met, and to identify measures necessary to mitigate any significant impacts. The site assessment may also serve as a basis for the County to apply restrictions in addition to those required by State and federal regulations.

Program BIO-4.h: Comply with SCA Criteria and Standards. All development permit applications shall be reviewed for conformity with these SCA policies, criteria, and standards and in accordance with the California Environmental Quality Act. Proposals that do not conform to SCA policies, and cannot be modified or mitigated to conform, shall be denied. If a proposal involves the creation of a new parcel that is wholly or partially in an SCA, the land division shall be designed to ensure that no development occurs within the SCA.

Program BIO-4.p: Implement NPDES Phase II. Continue to implement NPDES Phase II permit requirements relating to peak flow controls to ensure that project related and cumulative impacts to peak flows are minimized or avoided through conditions on project approval as required by the ordinances.

San Geronimo Valley Salmon Enhancement Plan (SGVSEP). This February 2010 plan was prepared for the Marin County Department of Public Works as an advisory document to inform landowners and public agencies on how to improve and maintain habitat conditions to support viable populations of salmonids in San Geronimo Valley, which lies in the Lagunitas Creek watershed immediately upstream of the proposed project site. The plan contains various recommendations for best management practices and land uses to help implement four basic core strategies, as follows: (1) preservation and improvement of habitat conditions for all salmonid life stages; (2) promotion of ecosystem resiliency through rehabilitating natural processes; (3) correcting and avoiding activities that degrade habitat wherever possible; and (4) sustainment of the character and quality of life in San Geronimo Valley.

The SGSVEP does not have any regulatory authority; nor does it directly apply to the Lagunitas Creek watershed downstream of the San Geronimo Valley. Nevertheless, the SGVSEP contains many recommendations for protecting salmonid habitat that should reasonably be used throughout the entire Lagunitas Creek watershed, given the presence of the same habitat and salmonid populations.

4.3.3 Significance Criteria

Appendix G of the *CEQA Guidelines* provides that a project may have a significant impact on biological resources if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, adopted policies, or regulations, or by the California Department of Fish and Game or United States 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 CDFG or USFWS.
- Have a substantial adverse effect on federally or State protected wetlands as defined by Section 404 of the Clean Water Act or Porter-Cologne Water Quality Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan; Natural Community Conservation Plan; or other approved local, regional, or state habitat conservation plan.
- Substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; or substantially reduce the number or restrict the range of an endangered, rare or threatened species.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant impact related to biological resources if it would:

- Substantially reduce the number or restrict the range of a rare, endangered, or threatened plant or animal.
- Cause a fish or wildlife population to drop below self-sustaining levels.
- Adversely affect significant riparian lands, wetlands, marshes, and other significant wildlife habitats.

4.3.4 Impacts and Mitigation Measures

The following section presents a discussion of potential impacts to biological resources that could result from implementation of the proposed project. Mitigation measures are recommended to reduce

potential impacts to less-than-significant levels. Less-than-significant impacts are discussed first followed by significant impacts.

(1) San Francisco Foxtail Damselfly. This species breeds in shallow pond areas in stream channels that would not be directly affected by the project. The project could cause indirect impacts to this species as a result of grading and earthmoving activities that have the potential to release sediment and other pollutants that could eventually reach Lagunitas Creek and degrade aquatic habitat. However, the project's Stormwater Pollution Prevention Plan (SWPPP) includes a range of erosion control and water quality Best Management Practices (BMPs) to be implemented during and after construction in accordance with RWQCB and Marin County standards. Implementation of these BMP measures would prevent the release of sediment and pollutants into Lagunitas Creek. Therefore, impacts to this species would be considered less than significant.

(2) California Freshwater Shrimp. No proposed construction activities are proposed directly within Lagunitas Creek, which is identified as habitat for the California freshwater shrimp. The project could cause indirect impacts to this species as a result of grading and earthmoving activities that have the potential to release sediment and other pollutants that could eventually reach Lagunitas Creek and degrade aquatic habitat. However, the project's SWPPP includes a range of erosion control and water quality BMPs to be implemented during and after construction in accordance with RWQCB and Marin County standards. Implementation of these BMP measures would prevent the release of sediment and pollutants into Lagunitas Creek. Therefore, impacts to California freshwater shrimp would be considered less than significant.

(3) Loss of Ruderal Habitat, Annual Grassland and Other Common Vegetation Communities. Implementation of the proposed project would disturb common vegetation communities/wildlife habitats (i.e., ruderal, annual grasslands, coastal oak woodland, coastal scrub, mixed evergreen forest, and redwood forest) within the project study area. Most of the project site, the existing roadway, is covered by cement/asphalt. Vegetation to be removed occurs along the edge of the existing roadway and consists primarily of ruderal vegetation, annual grassland, and other common vegetation types. As these vegetation types are locally common and very small amounts of habitat would be disturbed as a result of construction activities, this impact is considered less than significant.

(4) Wildlife Movement Corridors. Open space adjacent to the project area provide high quality habitat and a significant movement corridor for a variety of common and special-status wildlife species. Sir Francis Drake Boulevard (SFDB) and its associated traffic likely restricts the movement of smaller mammals, amphibians, reptiles, and other less mobile wildlife species between habitat areas north and south of the project area. However, existing culverts under the roadway provide potential movement corridors for these species. Larger mammals, bird species, and other more mobile wildlife species likely travel between habitat areas with greater ease, but are still limited by traffic along SFDB.

Implementation of the proposed project would limit wildlife movement through the project area during the construction period. However, these impacts would be short-term (approximately nine months) and would occur only during daylight hours when construction activities occur. Upon completion, SFDB would be similar in size and scale to the existing roadway. Therefore, it is

anticipated that wildlife would continue to use the project site as a wildlife movement corridor after rehabilitation of the roadway and the underlying culverts are complete.

Installation of bioswale structures along portions of the rehabilitated roadway would permanently remove some upgraded culverts from use as wildlife movement corridors by small mammals, amphibians, and reptiles. The loss of these culverts as potential wildlife movement locations would reduce the overall wildlife movement corridors available in the project study area. However, removal of these culverts would not be considered significant because many culverts would remain for wildlife movement after construction is complete, and wildlife would continue to be able to cross SFDB. Additionally, the project would improve potential wildlife movement capacity for at least 26 of the project's 72 culverts that would be upgraded to larger diameters. Therefore, the impact on wildlife movement through the project area is considered less than significant.

Impact BIO-1: Implementation of the proposed project could impact special-status plant species. (S)

Based on the results of the CDFG protocol-level plant surveys, no special-status plants have been observed within the project site. However, special-status plants are known to occur in the vicinity of the project site (e.g., Napa false indigo, Tiburon Indian paintbrush). Subsequent to the last known surveys and the start of the project, new populations of special-status plants may colonize the project area and/or previously undetected populations of special-status plants could re-appear. Grading activities associated with shoulder widening, installation of bioswales and retaining walls, drainage improvements, construction of car pullouts, and slide repair activities has the potential to directly impact special-status plant populations. Impacts could also occur from the movement of construction equipment within the work area. Impacts to future populations of special-status plant species, if they were to occur, would be considered significant.

> Mitigation Measure BIO-1: A qualified botanist shall conduct additional CDFG protocol-level surveys within and immediately adjacent to the zones that would be disturbed by construction work. The surveys shall be conducted in the year within which construction is to commence. To the extent allowed under the construction schedule, surveys shall be conducted during the flowering period of the special-status plants that have a high potential to occur within the project area (January through August). If any special-status plant species are observed within or adjacent to the disturbance zones, Marin DPW shall implement the following:
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> - A qualified botanist shall delineate the locations of any special-status plant populations adjacent to the disturbance zones and shall supervise the installation of temporary protective construction fencing between the disturbance zones and the plant population. The fencing shall remain in place until construction is completed and all construction equipment has been removed from the vicinity.
> - If any special-status plant population is identified within the construction disturbance zones, the Marin DPW shall consult with CDFG and CNPS to determine appropriate avoidance and/or mitigation measures for impacts to the population. If the special status plant is federally listed as Threatened or Endangered, the Marin DPW shall also consult with the USFWS. At a minimum, avoidance and mitigation measures shall entail the following:

a. Marin DPW shall adjust the boundaries of the disturbance zones, where feasible, to avoid impacts to the plant population.

b. Where avoidance is not feasible, the Marin DPW shall implement one or more of the following measures, based on the prior consultation with CDFG and CNPS: 1) transplant affected plants to suitable habitat areas outside the disturbance zones; 2) collect and properly store seeds of affected plants; subsequently re-seed suitable habitat areas outside the disturbance zones; 3) prepare and implement a long-term management/enhancement plan for existing off-site populations of the affected plant species.

Significance After Implementation. Implementation of Mitigation Measure BIO-1 will reduce the potential impact to special status plant species to ***less than significant***.

Impact BIO-2: Implementation of the proposed project could impact special-status invertebrate species potentially present within the project area. (S)

Implementation of the proposed project could potentially impact invertebrate species in the project area, including Marin elfin butterfly, Myrtle's silverspot butterfly and Marin hesperian.

Marin elfin butterfly. Construction activities could disturb populations of the species host plant, spoon-leaved stonecrop. This host plant was not observed in the project site during field surveys; however populations of the plant were identified within the project study area adjacent to the project site. Therefore the host plant could become established within the project site in the future. If present, grading activities associated with project construction could potentially impact populations of this species' host plant. Removal of the host plant could significantly affect populations of Marin elfin butterfly.

Myrtle's silverspot butterfly. Construction activities could disturb populations of the species host plant, western dog violet. The host plant was not observed in the project study area during field surveys; however, populations could become established in the future. If present on the project site, grading activities associated with project construction could impact populations of this species' host plant. Removal of the host plant could significantly affect populations of Myrtle's silverspot butterfly.

Mitigation Measure BIO-2a: During the spring and summer period prior to the start of construction, a qualified botanist shall conduct pre-construction surveys of the project site for the host plants of the Marin elfin butterfly and Myrtle's silverspot butterfly. Identified plant populations shall be marked for avoidance by project activities. If a plant population cannot be feasibly avoided, individual plants will be relocated by a qualified botanist to a location adjacent to the project disturbance zone.

Significance After Implementation. Implementation of Mitigation Measure BIO-2a will reduce the potential impact to the Marin elfin butterfly and Myrtle's silverspot butterfly impact to a ***less-than-significant*** level.

Marin hesperian. Construction activities could potentially directly impact this species of terrestrial snail if its habitat is disturbed. This species has been documented within the project study area;

however, it was not observed during recent field surveys. Impacts on the Marin hesperian would be potentially significant unless mitigated.

> Mitigation Measure BIO-2b: Implement re-vegetation and habitat restoration measures described in Mitigation Measures BIO-9a and BIO-9b.

Significance After Implementation. Implementation of Mitigation Measures BIO-9a and BIO-9b would reduce potential impacts to the Marin hesperian to ***less than significant***.

Impact BIO-3: Implementation of the proposed project could impact bird species protected under the Federal and State Endangered Species Act. (S)

Northern spotted owls (Federal listed Threatened) have a high potential to occur in the project study area, based on the documented presence of this species in the vicinity and the presence of suitable habitat in the project study area both north and south of the project site. Marbled murrelets (Federal listed Threatened; State-listed Endangered) are not known to nest in Marin County and they are not expected to occur in the vicinity of the project site. Therefore the proposed project would have no impact on the marbled murrelets.

Potential impacts to northern spotted owl could include: (1) tree removal associated with the slope repair/retaining wall at 270+25 could potentially impact nesting sites; (2) tree removal associated with road or shoulder widening under Option A could potentially impact nesting sites; and (3) disturbance (harassment) of nesting birds in the vicinity of the project site due to noise from construction activities.

The approximate distance that project-generated noise and/or visual disturbance could lead to harassment of nesting spotted owls can be addressed using the methodology developed by the USFWS (USFWS 2006). This method involves comparing the existing ambient sound levels in the project area with the anticipated project-generated sound levels. The existing relative sound levels in the project area likely range from ambient (e.g., forest habitat) during the night and in the early morning hours (e.g., 0100 to 0300 hours) to high (e.g., trucks, highway traffic) during peak traffic conditions in the day. Based on the Federal Highways Administration (FHWA) Traffic Noise Prediction Model, sound levels within the project site are expected to range from 58 – 61 dB based on a weighted day-night average (see Section 4.10, Noise). Project-generated sound levels associated with general construction equipment, dump truck, front-end loader, etc., are anticipated to reach a relative sound level of high (91 dB) (see Section 4.10).

Under the USFWS methodology for estimating potential harassment distance from a given project, the potential harassment distance for the project site is 50 meters (165 feet), based on a project generated a sound level of high compared to an existing (ambient) sound level ranging from low to high during construction hours. Therefore, the area of potential harassment to northern spotted owls from the proposed project is 165 feet from the edge of the project disturbance zone.

> Mitigation Measure BIO-3a: Prior to initiation of construction activities (in April or May of the construction year) the Point Reyes Bird Observatory (PRBO) shall be contacted to obtain the results of any new spotted owl surveys that were conducted in the project vicinity. If such surveys indicate that spotted owls are nesting within 165 feet of the construction area, the

USFWS and CDFG shall be consulted regarding additional avoidance and minimization measures.

Mitigation Measure BIO-3b: If construction work is scheduled during the breeding season (March 1 through August 30), a qualified wildlife biologist shall conduct pre-construction surveys of all suitable nesting trees in the project disturbance zone and within 165 feet of the disturbance zone to determine if nesting birds of either species are present. (Preconstruction surveys will not be required for construction work carried out in the non-breeding season August 30 through February 28/29.) The pre-construction surveys shall be conducted within 15 days prior to the start of work from March 1 through May 31 (since there is higher potential for birds to initiate nesting during this period), and within 30 days prior to the start of work from June 1 through August 30. All suitable nesting trees within 165 feet of the construction disturbance zone will be surveyed.

If active nests of either species are found in the work area, the USFWS and CDFG will be consulted as to appropriate avoidance and minimization measures prior to the initiation of work. At a minimum, the following avoidance and minimization measures shall be implemented:

a. In order to avoid and minimize impacts on nesting northern spotted owls during project implementation, a 165-foot buffer shall be established around active nesting sites. No project construction activities shall be allowed to occur within this zone until a qualified biologist has determined that all juveniles have fledged from occupied nests.

b. Buffer zones shall be clearly delimited using construction fencing or other suitable barrier material to the extent feasible based on site conditions.

c. Construction activity, site access by equipment and vehicles, and operations at the staging areas shall be limited to daytime hours. No nighttime work shall be allowed on the project. Activities shall begin no earlier than one-half hour after sunrise and shall end no later than one-half hour before sunset.

d. Any required tree trimming of trees to be avoided shall be done according to arborist guidelines to minimize the effects to trees. Trimming of trees must not jeopardize the survival of trees.

e. A report documenting the results of preconstruction surveys and nest protection and monitoring shall be provided to USFWS and CDFG within 4 weeks of completion of work in the vicinity of active nests.

Significance After Implementation. Implementation of Mitigation Measures BIO-3a and BIO-3b will reduce the potential impacts to the northern spotted owl to ***less than significant***.

Impact BIO-4: Implementation of the proposed project could impact special-status bird species protected under the MBTA potentially nesting in and adjacent to the project area. (S)

Implementation of the proposed project could potentially result in impacts on nesting special-status bird species located in the proposed project disturbance zone and adjacent areas. Implementation of the project could also impact common nesting bird species protected under the MBTA and under

Sections 355 and 356 of the California Fish and Game Code (including migratory birds and raptor species).

Direct impacts to special-status, migratory, and raptor bird nests could occur during removal of vegetation within the project disturbance zone. Removal of eight trees under the proposed project and nine additional trees under Option A could also lead to the direct removal and destruction of bird nests and nesting habitat. Indirect impacts to nesting bird species could occur if bird species abandon active nest sites due to noise generated by construction activities, or due to visual disturbance due to the increased presence of construction workers and equipment in the project study area.

No special-status bird species were observed nesting in the project study area during field surveys, however, they could establish active nest sites prior to implementation of the proposed project. Additionally, a number of active and inactive nest sites of other bird species were observed during field surveys. Impacts to active nest sites could be a potential violation of the MBTA Sections 355 and 356 of the California Fish and Game Code, and therefore a significant impact.

Mitigation Measure BIO-4: If construction work is scheduled during the breeding season (March 1 through August 30), a qualified wildlife biologist shall conduct pre-construction surveys within and adjacent to the project disturbance zone to determine if nesting birds are present. (Preconstruction surveys shall not be required for construction work carried out in the non-breeding season August 30 through February 28/29.) The pre-construction surveys shall be conducted within 15 days prior to the start of work from March 1 through May 31 (since there is higher potential for birds to initiate nesting during this period), and within 30 days prior to the start of work from June 1 through August 30.

If active nests are found in the work area, the biologist shall determine an appropriately sized buffer around the nest in which no work shall be allowed until the young have successfully fledged. The size of the nest buffer shall be determined by the biologist in consultation with the CDFG, and shall be based on the nesting species, the context of the nest site in relation to existing human activity and its sensitivity to disturbance, and the expected types of disturbance. No project construction activities shall be allowed to occur within this zone until a qualified biologist has determined that all juveniles have fledged from occupied nests. At a minimum, the following buffer zones shall be implemented:

- *Yellow Warbler.* Yellow warblers typically nest and rear young from April through July. In order to avoid and minimize impacts on nesting yellow warblers during project implementation, a 25 to 50-foot buffer shall be established around active nesting sites when project activities shall occur during their breeding and nesting period. No project activities shall be allowed to occur within this zone. The buffer area can be removed prior to July if a qualified biologist determines that all juveniles have fledged from occupied nests.
- *Osprey.* Osprey typically nest and rear young from March through September. In order to avoid and minimize impacts on nesting osprey during project implementation, a 200-foot buffer shall be established around active nesting sites when project activities shall occur during their breeding and nesting period. No project activities shall be allowed to occur within this zone. The buffer area can be removed prior to September if a qualified biologist determines that all juveniles have fledged from occupied nests.

- *Other Raptor Species.* Other raptor species typically nests and rear young from early April through August. If these species are found to be nesting, impacts shall be avoided and minimized by establishing a 200-foot buffer around active nest sites. No project related activities should be allowed to occur within this buffer until young have fledged or the species are no longer attempting to nest. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.
- *Other Migratory Birds.* Migratory bird species typically nest and rear young from February through August. In order to avoid and minimize impacts on migratory bird species, a 25 to 200-foot buffer shall be established around active nesting sites when construction activities shall occur during their active nesting period. No project-related activities shall occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

  A report documenting the results of preconstruction surveys and nest protection and monitoring shall be provided to CDFG within 4 weeks of completion of work in the vicinity of active nests.

Significance After Implementation. Implementation of Mitigation Measure BIO-4 will reduce project impacts to special-status and other protected bird species to ***less than significant***.

Impact BIO-5: Implementation of the proposed project could impact federal and/or state listed salmonid species - Central California Coastal coho salmon, Central California Coast steelhead, and California Coastal chinook salmon. (S)

Direct Impacts to Salmonids - "Take" during Construction.[46] The proposed project would not directly impact salmonids in Lagunitas Creek since no work is proposed in the creek channel. The project could potentially cause direct impacts to salmonids in tributaries to Lagunitas Creek where existing culverts beneath SFDB would be removed and replaced with upgraded culverts. However, none of the tributaries with culverts that currently allow relatively unimpeded passage by all age classes of salmonids would be affected by this work (i.e., the Cheda Creek, McIssac Creek and Devil's Gulch tributaries). Culvert replacement work would be limited to other ephemeral and intermittent tributaries with small culverts that do not allow salmonid passage or that may allow very limited opportunities for passage in the winter and spring. Based on the time period for the proposed work (May 15 - October 15) the culvert replacement would occur when there is typically little or no flow in the tributaries. However in an abnormally wet rainfall year or following a significant late season storm or series of storms, flow could occur in the tributaries resulting in the potential for salmonid take. Therefore, the culvert replacement work in the tributaries could cause a significant direct impact to salmonids.

Indirect Impacts to Salmonids during Construction. The proposed project has the potential to cause indirect impacts to salmonids as a result of the following construction-related activities: grading and other earthmoving; slope repair along the upper stream bank of Lagunitas Creek at Station 270+25; tree removal; culvert replacement work; construction equipment operation, maintenance and storage; fuel and other materials storage. Each of the potential impacts to salmonids from these construction activities is discussed below:

[46] "Take" is defined under the ESA includes any activity that would to harass, harm, trap or kill a listed species.

Impacts to salmonids due to temporary changes in the volume and timing of storm water runoff into Lagunitas Creek during construction. During the construction period (May 15 - October 15), the location and volume of runoff from the construction zone could be altered due to flow across temporarily altered grading zones and across areas where fill and other construction materials are stored. Temporary alterations of the road surface and adjacent grading zones could also modify runoff patterns. During the May 15 - October 15 period, salmonids in Lagunitas Creek are in the juvenile rearing and out-migration phases of their life cycles and are dependent on maintaining adequate baseflows in the creek.

The protection of summertime baseflows for juvenile rearing habitat is given a high priority for San Geronimo Creek under the SGVSEP. This recommendation would also be highly relevant to Lagunitas Creek due to the presence of the same salmonid habitat concerns.

Construction work under the proposed project is unlikely to affect Lagunitas Creek baseflows because the work would be limited to the May 15-October 15 period when rainfall is minimal. Changes to surface runoff from the project site during this period would be insufficient to appreciably influence stream flows. Therefore, the project's effects on the volume and timing of storm water runoff during the construction period would have a less-than-significant impact on salmonids in Lagunitas Creek.

Impacts to salmonids due to temporary water quality degradation in Lagunitas Creek during the construction period. During construction, the proposed project would have the potential to cause significant adverse impacts to salmonids due to runoff and/or direct discharges of contaminated water from the construction site. Project construction would have the potential to discharge silt and sediment into Lagunitas Creek, and to cause high levels of turbidity. Project construction work could also result in the release of oil and grease, hydrocarbons and metals. All these contaminants could adversely affect the water quality of spawning, rearing, feeding and migration habitats downstream, which may impair salmonid egg incubation, rearing, feeding, respiration, or behavior (Tables 4.3-C and 4.3-D). Inadvertent releases of fuels and other petroleum-based products and wet or uncured cement/concrete, could be toxic to salmonids and other aquatic organisms (Tables 4.3-D).[47]
The protection of salmonid habitat from increases in fine sediments, turbidity, metals and other runoff-associated pollutants is recognized under the SGVSEP as a high priority management goal for San Geronimo Creek. This recommendation would also be highly relevant to Lagunitas Creek due to the presence of the same salmonid habitat concerns.

Complex relationships exist between various categories of water quality contaminants and salmonid life cycles. The particular relationships relevant to the proposed project are succinctly summarized in Tables 4.3.C and 4.3.D. The tables analyze each category of contaminant with respect to the following:

- potential effects on salmonids in Lagunitas Creek;
- the probable existing sources of the contaminant along the SFDB corridor;
- the potential effects of the proposed project on these existing sources;

[47] Conversely, post-project design improvements have the potential to improve SFDB's effects upon water quality in Lagunitas Creek and therefore be beneficial to salmonids (see discussion below).

- the potential for the proposed project to create new sources of the contaminant during construction;
- the potential for the proposed project to create new sources of the contaminant under post-construction conditions; and
- suitable mitigation measures for avoiding and/or minimizing impacts from the contaminant.

Impacts to salmonids due to construction-related disturbance of riparian vegetation. Although permanent removal of riparian vegetation is limited to 8 trees under the proposed project and an additional 9 trees under Option A, there is the potential for the additional loss of other riparian trees and shrubs due to inadvertent damage during construction (see Impacts BIO-9 and BIO-10 below). Such additional loss or damage to riparian vegetation could cause significant adverse impacts to salmonids by resulting in: new streamside erosion and associated sedimentation in the Lagunitas Creek; loss of stream shading and associated water temperature increases in the creek; and reduction in large woody debris in the creek.

Post-Construction Impacts to Salmonids. Changes to the project area that would result from implementation of the proposed project could adversely affect salmonids. These impacts are described below.

Impacts to salmonids due to post-construction hydromodification of Lagunitas Creek. The proposed project has the potential to cause hydromodification (changes in the volume, velocity and duration of runoff) in Lagunitas Creek (see Impact 4.6.4 below). Hydromodification under the proposed project could result from an increase in the total impervious surface area (TIA) and/or an increase in the effective (connected) impervious area (EIA) in and along SFDB. Such hydromodification could adversely impact salmonids by causing the following effects: (1) channel downcutting and incision resulting in a separation of the channel from important feeding habitat and juvenile rearing habitat on the adjacent floodplain and off-channel areas; (2) reductions in large woody debris recruitment; (3) loss of riparian vegetation and associated food sources; (4) scouring and/or fine sediment deposition.

Table 4.3.C: Summary of Potential Sediment, Turbidity and Water Temperature Impacts of Concern to Salmonids

Parameter:	Fine Sediment & Turbidity	Water Temperature Increase
Effects on salmonids	High concentrations can injure or kill salmonids by the following effects: • clogging and abraiding gills; • adhering to egg chorion - suffocating eggs and alevin; entomb different life stages; • preventing invertebrate larval development and emergence; and • altering water chemistry by absorption of chemicals and increasing toxicity levels. High concentrations can adversely affect salmonid reproduction and populations by the following effects: • reducing photosythesis, primary production and associated higher trophic level food sources; • increasing bedloads - filling pools and riffles thereby reducing rearing habitat quality; • increasing scour, thereby reducing spawning gravel areas; • collecting sediment in interstitial spaces in spawning gravels; decreasing gravel stability, changing inter-gravel permeability thereby reducing water flow between gravels and decreasing DO levels; • adversely affecting emergence and rearing due to suffocation of eggs, blocking fry emergence, changes in timing of fry emergence; • increasing stream water temp in gravels and pools due to loss of bottom reflectivity; • reducing the value of downstream estuarine habitat for juveniles; • interfering in homing ability of adults.	Water temperature increases can adversely affect salmonids by the following effects: • increasing susceptibility of salmonids to diseases; • adversely affecting egg hatching timing; • increasing algal and phytoplankton production thereby decreasing DO levels which can be fatal to salmon. • changing ambient stream temperatures beyond the ranges suitable for stream for salmonid migration, rearing and emergence; and • promoting dominance by warm water fish over salmonids.
Existing sources along SFDB	• Runoff from the road surface and unpaved road shoulders. • Road maintenance activities: pothole repairs, surface cleaning, shoulder maintenance, etc. • Runoff from unpaved roadside parking areas and turnouts. • On-going erosion along streambanks from: culvert outflows, banks	None likely.

Parameter:	Fine Sediment & Turbidity	Water Temperature Increase
	beneath "shotgun" culverts," bank erosion at Station 270+25. • Failure of existing degraded pavement leading to erosion and increase sedimentation. Fractured pavement is causing the discharge of asphalt binder and aggregate into the receiving watershed. • Debris plugging of culverts causing road bank failures.	
Effects of the project on these existing sources	The project will reduce sedimentation from existing sources along SFDB as follows: • repaving of road and paving of shoulders; installation of a 2-inch permeable friction course overlay over the entire road surface; • installation of larger diameter culverts (many at 100-year storm capacity), thereby reducing frequency of flooding across the road surface, reducing influxes of sediments into Lagunitas Creek; • installation of a new inboard road swale/sand filter designed to trap sediment; • seeding/planting of a natural vegetative buffer where the road slopes toward the creek; stabilized slopes; • closure of unpaved parking areas and turnouts; paving of remaining turnouts; • installation of riprap and erosion fabric/seeding beneath actively eroding culvert outlets; • installation of the retaining wall/bank stabilization at Station 270+25; and • retro-fitting "shotgun" culverts with downspouts and energy dissipaters.	No effect.
Possible new sources during construction	• Exposed slopes and soils during grading and stockpiles; temporary slope destabilization. • Proposed project tree removal at Station 270+25, tree removal under Option A – disrupting root binding effect on soil and possible slope destabilization. • Runoff from equipment staging and storage areas. • Runoff from vehicle fueling and maintenance areas.	• Increased sedimentation can lead to increased water temperatures (see above).

Parameter:	Fine Sediment & Turbidity	Water Temperature Increase
	• Dust emissions during construction. • Runoff from saw-cutting of the pavement. • Discharge of particulates during crack and seat and asphalt grinding. • Discharge of asphalt during repaving. • Temporary dewatering.	
Possible new sources following construction	None.	• Removal of 8 redwoods and bay trees at Station 270+25 may decrease stream shading and cause localized temperature increases, depending on orientation of the individual trees with respect to Lagunitas Creek. However, this impact is not significant because: (1) only 4 of the affected trees are large enough to have possible canopy shade affects on the stream; (2) based on the orientation of the 4 trees relative to the creek, they are likely to provide appreciable shade only during mid-late afternoon periods. • Removal of 8 redwoods and on oak under Option A may also decrease stream shading. However, this impact is not significant because only 3 of the affected trees' orientation could have possible canopy shade affects on the stream and this effect is limited to the early-mid morning.
Mitigation measures for the new sources	• Storm Water Pollution Protection Plan (SWPPP) includes wide range of measures for controlling sediment and turbidity during construction • Highly effective sediment removal for sand filtered bioswales; fine sediment removed through vegetative filtering and percolation-uptake through sand medium; course to medium sediments removed through detention effects and vegetative filtering. • Road maintenance activities to be conducted in accordance with SWMP performance standards and FishNet 4C Roads Manual.	• Mitigation for shade not needed since the effects are insignificant. Nevertheless, under Mitigation Measure Bio-9a (see below), native trees shall be planted along the east side of Lagunitas Creek downstream from Peters Dam. As these trees mature, they will provide new shade benefits to the creek in this area.

Table 4.3.D: Summary of Potential Chemical Impacts of Concern to Salmonids

Parameter:	Pesticides, Herbicides & Fungicides	Fertilizers, Nutrients	Other Constituents: Hydrocarbons (gasoline and other petroleum products); Metals (e.g., Pb, Cu, Ca, Zn, Hg)
Effects on Salmonids	• Toxins associated with these chemicals, in particular chlorpyrifos, diazinon and malathion, can be highly toxic to salmonids as well as the invertebrate organisms upon which they feed. Diazinon can disrupt antipredator and homing behaviors in chinook. • Malathion at sub-lethal levels can adversely affect swimming behavior and survival of salmonids.	• Influxes of fine organic sediment can have same affect as inorganic sediment – degrading spawning gravels and DO in the interstitial zones – decrease spawning success, increase egg and alevin mortality. • Nutrient enrichment can lead to reduced DO which can adversely affect redds, egg and alevin survival, and result in reduced size, viability and fitness of salmonid juveniles.	• PAH, PCB can bio-accumulate in sediment-dwelling invertebrates and then taken up by salmonids – can lead to changes in immune functions, increased disease, neurotoxic effects. • Metals at various concentrations can have lethal to sublethal effects on salmonid populations.
Existing sources and estimated/ measured levels	None likely - roadside maintenance is conducted by DPW and is limited to mechanical methods.	• Fine organic debris and other nutrients on road surface will discharge to creek during storms. • Emergency hydroseeding of slopes following erosion events or wildfires could result in nutrient runoff into Lagunitas Creek if the hydroseed mix contains fertilizer.	• Oil, grease other hydrocarbons on the road surface – particularly those that accumulated over the dry season and get discharges in the first storm events of the season. • Exhaust emissions from vehicular traffic – metals and hydrocarbons. • Degradation of existing asphalt - fractured pavement is causing the discharge of asphalt binder and may be releasing toxic metals into the receiving watershed.
Effects of the project on these existing sources	No effect.	• Larger diameter culverts should reduce frequency of flooding across the road surface, reducing influxes of nutrients. • Effective removal of organics from sand filtered bioswales. • Permeable friction course is effective in reducing in Total Kjeldahl nitrogen from road surfaces for short term following application but about the same as other road surfaces over the long-term.	• Repaving of road and paving of shoulders; installation of a 2-inch permeable friction course overlay over the entire road surface will eliminate fractured pavement effect. • Effective removal of oil and grease and metals from sand filtered bioswales.

Parameter:	Pesticides, Herbicides & Fungicides	Fertilizers, Nutrients	Other Constituents: Hydrocarbons (gasoline and other petroleum products); Metals (e.g., Pb, Cu, Ca, Zn, Hg)
Possible new sources during construction	None.	• Hydro-seeding of exposed slopes could lead to nutrient runoff if hydroseed mix contains fertilizer.	• Construction equipment operation; fueling and fuel storage; solvents used during cleaning of equipment. • Discharge of particulates during crack and seat and asphalt grinding. • Discharge of asphalt during repaving. • Temporary dewatering. • Discharges from signing and striping activities.
Possible new sources following construction	• Roadside vegetation management.	None.	• Long-term degradation of new asphalt roadbed – leaching of hydrocarbons and toxic metals.
Mitigation measures for the new sources	• Perform roadside vegetation management in accordance with SWMP performance standards and Fish Net 4 C BMPs (Roads Manual).	• Hydroseed mixes shall not contain fertilizer. No other fertilizers will be applied except in planting holes for initial tree re-plantings.	• Storm Water Pollution Protection Plan (SWPPP) includes wide range of measures for discharges of hydrocarbons during construction; also includes target metals associated with sediment runoff. • Perform road maintenance BMPs in accordance with performance standards in SWMP, and in accordance with Fish Net 4 C Roads Manual. • Use of impervious rubberized asphalt concrete (RAC) significantly reduces toxic metal leachates associated with asphalt; when used in combination with roadside treatment swales (as will occur under the proposed project), all toxicity can be eliminated through soil filtration (see Section 4.6 below).

of salmonid redds thereby destroying incubating eggs and alevins (larvae); and (5) loss of habitat suitability within the main channel due to excessive flow velocities.[48]

The SGVSEP recognizes the need to minimize the extent of EIA within the San Geronimo Valley watershed because EIA can cause downstream impacts on salmonid habitat. The plan recommends that there be no net increase in EIA for new development or re-development activities. This recommendation would be generally relevant to the greater Lagunitas Creek watershed, but probably less critical in the case of the project area watershed, given the significantly lower amount of existing EIA as compared to San Geronimo Valley.

Section 4.6.4 (under *Hydrology and Water Quality*) indicates that the total impervious area (TIA) under the proposed project would increase by approximately 7 percent from approximately 655,000 square feet to 703,000 square feet (primarily due to paving of unpaved pullouts). Option A would add an additional 8,540 square feet of paved shoulder. The paved pullouts would be designed to avoid direct connection to Lagunitas Creek. Stormwater falling on the pullouts would percolate through the asphalt, a porous base, and be collected in a perforated pipe for discharge to the nearest culvert which may include a weir or orifice structure to reduce the discharge rate. Therefore, much of the additional impervious area under the project would probably not be considered EIA.

As a result of the increased impervious surface, the runoff volume generated from the 2-year, 24-hour storm would increase slightly from 331,000 cubic feet in the existing condition to 333,500 cubic feet for the project (an increase of 2,500 cubic feet).[49]
Section 4.6.4 provides a detailed analysis of the potential for the increased runoff to cause hydromodification of Lagunitas Creek. The analysis demonstrates that the project would not result in significant hydromodification. Calculations in Section 4.6.4 from all culvert outfalls that would contribute runoff to the creek from the project drainage area show that 2-year peak flows changes would range from -0.56 percent (i.e., a reduction in peak flow) to 0.58 percent. For 10-year peak flows, the calculated range is -0.90 percent to 0.93 percent. None of these changes are hydrologically significant. Therefore, the proposed project would have a less-than-significant impact on salmonids in Lagunitas Creek due to hydromodification.

Impacts to salmonids due to post-construction changes in the quality of storm water runoff into Lagunitas Creek. As summarized in Tables 4.3-C and 4.3-D, the proposed project could potentially cause a wide range of water quality impacts due to roadway and road shoulder runoff containing pollutants associated with vehicular traffic on the road, road maintenance activities, and leachates from roadway asphalt and retaining walls. The major categories of pollutants from these sources are: fine sediments and turbidity: pesticides, herbicides and fungicides; fertilizers and nutrients; hydrocarbons and metals. All these pollutants could adversely affect the water quality of spawning, rearing, feeding and migration habitats downstream, which may impair salmonid egg incubation, rearing, feeding, respiration, or behavior (Tables 4.3-C and 4.3-D). Inadvertent releases of fuels and other petroleum-based products and wet or uncured cement/concrete, could be toxic to salmonids and other aquatic organisms (Tables 4.3-D).

[48] Stillwater Sciences. 2009. San Geronimo Valley Existing Conditions Report. Prepared for the Marin County Department of Public Works, San Rafael, CA by Stillwater Sciences, Berkeley, CA. January 2009.
[49] Runoff volume analysis provided by BKF Engineers, March 2010.

A potential new source of water quality pollutants that the project could generate would be from the roadway retaining walls or the bank retaining wall at Station 270+25 if these walls were to be constructed with pressure treated wood. Pressure treated wood could be a source of copper, chromium and arsenic leachates that could enter Lagunitas Creek. These metals at various concentrations can have lethal to sublethal effects on salmonid populations. However, under the proposed project both types of retaining walls would be constructed using concrete. Therefore, the retaining walls would not be a source of metal leachates.

Major design elements of the proposed project have the potential to improve the quality of runoff from SFDB for several of the categories of pollutants cited above. Based on these design elements, the project should be beneficial to salmonids in Lagunitas Creek from a water quality perspective, as summarized below:

- Degraded roadway and shoulders. The repaving of existing degraded road and paving of unpaved shoulders should reduce these existing sources of fine sediment, nutrients, metals and hydrocarbons. Permeable friction course is particularly effective in reducing in total Kjeldahl nitrogen from road surfaces in the short term following asphalt application. The use of impervious rubberized asphalt concrete (RAC) significantly reduces toxic metal leachates associated with asphalt; when used in combination with roadside treatment swales (as would occur under the proposed project), toxicity could potentially be eliminated through soil filtration (see Section 4.6 below).
- Road surface flooding. The installation of larger diameter culverts (many at 100-year storm capacity) should reduce the frequency of flooding across the road surface, reducing influxes of sediments, nutrients, metals and hydrocarbons into Lagunitas Creek.[50] Additionally, the installation of a new inboard road sand filter bioswales should reduce the volume of sediment and nutrients that currently discharges across the roadbed and shoulders directly into Lagunitas Creek.
- Unstable slopes. The establishment of a natural vegetative buffer where the road slopes toward the creek and the stabilization of slopes should reduce the sediment generated from these active erosion zones.
- Parking areas and turnouts. The closure of unpaved parking areas and turnouts, and the paving of remaining turnouts with porous asphalt should reduce these existing sources of sediment.
- Culvert outlets along the upper bank of Lagunitas Creek. The installation of riprap and erosion fabric/seeding beneath actively eroding culvert outlets and the retrofitting of existing "shotgun" culverts with downspouts and energy dissipaters should reduce these existing sources of fine sediment.
- Eroding bank at Station 270+25. The installation of the retaining wall and bank stabilization at this location should reduce sources of direct discharge of fine sediment.

The design elements listed above should all contribute to a general improvement in the quality of stormwater discharged from SFDB. However, over time the effectiveness of these design elements

[50] An ancillary benefit of the culvert upgrading is a potential improvement in the ability of tributaries to supply gravel, cobble and woody debris to Lagunitas Creek. These improvements are consistent with the recommendations of the SGVSEP which call for the up-sizing culverts whenever possible to improve transport of gravel, cobble, and, where practical, large woody debris.

could decline in the absence of proper long-term maintenance. Suitable long-term maintenance guidelines are provided in The FishNet 4C Program, a County-based salmonid protection and restoration program of the six Central California Coastal Counties (4C) of Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, and Monterey. The FishNet 4C Program provides BMPs relating to protecting water quality, aquatic habitat and salmonid fisheries during maintenance activities, and incorporating aquatic habitat protections into land use regulations and policies. The program has developed specific county road maintenance guidelines for protecting salmonid habitat.[51]

In the absence of a proper long-term maintenance program as recommended under the FishNet 4C Program, the proposed project could cause a significant adverse impact to salmonids in Lagunitas Creek due to a gradual decline in runoff water quality under post-project conditions.

Impacts to salmonids due to post-construction changes in riparian habitat along Lagunitas Creek. Under the proposed project, 8 redwood and bay trees would be removed for the bank stabilization work at Station 270+25. An additional 8 redwood trees and one oak tree would be removed under Option A. All these trees occur along the upper bank of the creek or along the SFDB roadside and can be considered a part of the riparian corridor. As such, their loss could cause adverse impacts to salmonids by resulting in: new streamside erosion and associated sedimentation in the Lagunitas Creek; loss of stream shading and associated water temperature increases in the creek (reducing habitat suitability salmonid spawning, rearing and emergence); and reduction in large woody debris in the creek (reducing feeding and rearing habitat suitability). Each of these potential impacts is examined below:

- **Erosion.** The tree removal work at Station 270+25 would have a less-than-significant impact on salmonids with respect to erosion and sedimentation. This location is characterized by an actively eroding bank that is threatening SFDB. The purpose of the work is to remedy this erosion problem by constructing a bank stabilizing retaining wall. In the case of Option A, all the trees that would be removed are located along the roadside rather than below the top of bank. Although the affected trees are all large enough that their root systems likely extend well below the tops of banks, the removal work is not expected to generate new sources of erosion and sedimentation. The remnant root systems below the tops of bank should continue to serve in a bank holding capacity for several decades as redwood roots are very resistant to decay.
- **Loss of stream shading.** Only 4 of the affected trees under the proposed project are large enough to have possible canopy shade effects on the stream. Moreover, based on the orientation of the 4 trees relative to the creek, they are likely to provide appreciable shade only during mid-late afternoon periods. Only 3 of the affected trees under Option A are oriented to provide possible canopy shade affects on the stream and this effect is limited to the early-mid morning. Therefore, this impact is less-than-significant.
- **Loss Large Woody Debris.** The majority of the trees that would be removed under the proposed project and others under Option A are large enough that they could occasionally be a source for the recruitment of large woody debris into Lagunitas Creek. Large woody debris is recognized as

[51] FishNet 4C, MFG, Inc., and Pacific Watershed Associates, 2004. County Road Maintenance Guidelines for Protecting Aquatic Habitat and Salmon Fisheries. Updated 2007. Website: fishnet.marin.org/projects_roads_manual.html, accessed November 1, 2009.

a limiting factor for over-winter rearing of juvenile salmonids in Lagunitas Creek.[52] Therefore, the loss of any existing sources may be considered a significant adverse impact to salmonids.

Salmonid Mitigation Measures

Mitigation Measure BIO-5a: In accordance with Mitigation Measure HYD1a, a Storm Water Pollution Protection Plan (SWPPP), in accordance with the State Water Resources Control Board, National Pollution Discharge Elimination System (NPDES) Construction General Permit, shall be prepared and implemented.[53] The SWPPP shall include a wide range of Best Management Practices (BMPs) for controlling sediment and turbidity during construction. These BMP should include the following measures to avoid impacts to salmonids:

- Work below the tops of the creek bank, including culvert replacement work in the tributaries and bank repair along Lagunitas Creek, shall be allowed only during the period from June 15 to October 15 during low flow conditions. Culvert replacement work in a tributary shall occur only when there is no flow in the tributary or when in the opinion of the project biologist the flow is too low to allow salmonid passage through the culvert. Low tributary flows will be temporarily captured and diverted downstream from the work zone.
- No fill material, including asphalt or concrete, shall be allowed to enter the stream. Any concrete structures (such as culvert headwall construction) below the tops of banks shall be poured in tightly sealed forms and shall not be allowed contact with surface waters until the cement has fully cured. Poured concrete shall be excluded from the wetted channel for a period of 30 days after it is poured. During that time the poured concrete shall be kept moist, and runoff from the concrete shall not be allowed to enter the creek. Commercial sealants may be applied to the poured concrete surface where difficulty in excluding water flow for a long period may occur. If sealant is used, water shall be excluded from the site until the sealant is dry and fully cured according to the manufacturer's specifications.
- Water that contacts wet concrete and has a pH greater than 9.0 shall be pumped out and disposed of outside the creek channel.
- No substances toxic to aquatic life shall be discharged into Lagunitas Creek or its tributaries.
- There shall be no material deposition nor other channel disturbance below the ordinary high water line of Lagunitas Creek.
- There shall be no coffer dams or dewatering of Lagunitas Creek.
- Hydroseed mixes used to stabilize disturbed areas shall not contain fertilizers.
- Equipment maintenance and fueling areas shall be located at least 100 feet away from the creek bank. Fueling must be behind a containment barrier that shall prevent any spilled or leaked fuel from running into the creek. All equipment servicing must occur within

[52] Stillwater Sciences. 2008. Lagunitas limiting factors analysis: limiting factors for coho salmon and steelhead. Final Report. Prepared for the Marin Resource Conservation District, Point Reyes Station, California. 72pp. + Appends.

[53] See Section 4.6.2 and Mitigation Measure HYD-1 under *Hydrology and Water Quality* for further details on SWPPP requirements as they relate to the proposed project.

designated areas. All motorized equipment used during construction or demolition activities shall be checked for oil, fuel, and coolant leaks prior to initiating work. Any equipment found to be leaking fluids shall not be used in or around aquatic habitat features in order to minimize the chances of contaminating the habitat and potentially impacting sensitive species, particularly salmon and steelhead.

- The project's contractor shall prepare an emergency response and clean-up plan prior to beginning work at the site. The plan shall detail the methods to be used to contain and clean-up spills of petroleum products or other hazardous materials in the work area.
- All maintenance crew personnel shall receive environmental training about the sensitive nature of the special status species in the project vicinity. This training that shall include descriptions of the special status species and all project measures in place to protect the species during construction. Crews shall also be informed to stop all work and notify their supervisor or the project biologist if special-status species are observed within the project site.

Mitigation Measure BIO-5b: Post-construction (ongoing) road maintenance, including inspection and maintenance of roadside bioswales, shall be conducted in accordance with a long-term Storm Water Management Plan (SWMP) prepared prior to the start of construction in accordance with RWQCB and Marin County Stormwater Pollution Prevention Program (MCSTOPPP) standards, and approved by the RWQCB and Marin County. The SWMP shall also incorporate county road maintenance BMPs contained in the Fish Net 4C BMPs Roads Manual. [54]

Mitigation Measure BIO-5c: In order to avoid damage to existing riparian trees in the vicinity of the construction site, all native trees with trunks adjacent to excavation areas, equipment staging and material storage areas, as well as other areas with concentrated activity by construction equipment, shall be protected with temporary construction fencing. The fencing shall be placed at the edge of the construction zone as close as feasible to the edge of the tree driplines. No construction work, storage of equipment or materials or other disturbance shall be allowed within the protected areas. Additionally, redwood trees in the vicinity of the construction site shall be protected in accordance with Mitigation Measures BIO-10a through BIO-10i.

Mitigation Measure BIO-5d: Marin DPW shall make available suitable cuttings from the tree removal work for use as woody debris and in bio-engineered structures along Lagunitas Creek in order to enhance salmonid habitat. The Marin DPW shall notify the signatories to the February 7, 2007 *Memorandum of Understanding for Woody Debris Management in Riparian Areas of the Lagunitas Creek Watershed* (Marin Municipal Water District, Marin County Open Space District, California Department of Parks and Recreation, National Park Service, and the Marin County Resource Conservation District – see *Biological Assessment* – Appendix E) of the availability of the wood, and the signatories shall notify Marin DPW if they have use for the woody debris, and when they will collect the material. If the signatory agencies have not responded within 14 days Marin DPW shall dispose of the material in a legal manner.

[54] See Section 4.6.2 under *Hydrology and Water Quality* for further details on the MCSTOPPP requirements for compliance with RWQCB NPDES General Permit.

Significance After Implementation. Implementation of Mitigation Measures BIO-5a, 5b, 5c and 5d will reduce project impacts on salmonids to ***less-than-significant*** levels. Table 4.3.E summarizes project impacts on salmonids, corresponding mitigation measures, and the level of significance after implementation of mitigation.

Table 4.3.E: Summary of Impacts and Mitigation Measures – Salmonids

Impact	Level of Significance	Mitigation Measures	Significance After Implementation
1. Direct "take" of salmonids.	S	BIO-5a	LTS
2. Indirect impacts from temporary changes in the volume and timing of storm water runoff into Lagunitas Creek during construction.	LTS	--	--
3. Indirect impacts due to temporary water quality degradation in Lagunitas Creek during the construction period.	S	BIO-5a	LTS
4. Indirect impacts due to construction-related disturbance of riparian vegetation.	S	BIO-5c	LTS
5. Indirect impacts due to post-project hydromodification of Lagunitas Creek.	LTS	--	--
6. Indirect impacts due to post-project changes in the quality of storm water runoff into Lagunitas Creek.	S	BIO-5b	LTS
7. Indirect impacts due to post-project changes in riparian habitat along Lagunitas Creek.	S	BIO-5d	LTS

Impact BIO-6: Implementation of the proposed project could impact other special-status fish species. (S)

Implementation of the proposed project could potentially impact the following fish species known to occur in Lagunitas Creek - Tomales roach and chum salmon. The various potential direct and indirect impacts described above for federal and state listed salmonid species would also be generally applicable to these other special status species. Therefore the proposed project would have a significant impact on these special status species.

> Mitigation Measure BIO-6: Implement measures to protect special-status salmonids described in Mitigation Measures BIO-5a through BIO-5d.

Significance After Implementation. Implementation of Mitigation Measures BIO-5a through BIO-5d will reduce potential impacts to other special status fish species to ***less-than-significant*** levels.

Impact BIO-7: Implementation of the proposed project could impact special-status amphibian and reptile species potentially present within the project area. (S)

Implementation of the proposed project could potentially impact individual northwest pond turtles, California red-legged frogs, and foothill yellow-legged frogs if they are present within stream

channels during drainage improvements. No construction activities are proposed directly within Lagunitas Creek, which is identified as habitat for these species; however, grading and earthmoving activities associated with work activities have the potential to release sediment and construction materials that could eventually reach Lagunitas Creek. As a preventative measure, Marin DPW has committed to implementing standard construction best management practices as part of the proposed project, including conducting project activities during the summer non-rainy season, and using standard erosion control measures. Implementation of these measures would prevent the release of sediment and construction materials into Lagunitas Creek.

These species could be present in larger streams tributary to Lagunitas Creek, and direct mortality of individual or small populations of these species could occur during project activities. Impacts to these species would constitute a significant impact.

> Mitigation Measure BIO-7a: Prior to work beginning in any habitats containing appropriate habitat for northwestern pond turtle, foothill yellow-legged frog, or California red-legged frog a qualified biologist shall conduct focused pre-construction surveys for these species. The Preconstruction surveys for California red-legged frog shall be completed within 48 hours prior to commencement of any earth-moving activity, construction, or vegetation removal, whichever comes first. The preconstruction survey shall include two nights of nocturnal surveys in areas of suitable habitat. The biologist performing the preconstruction survey must hold a federal 10(a)(1)(A) permit for California red-legged frog or be considered by USFWS to be a "service approved" biologist.
>
> If any of the above special-status amphibian and reptile species are encountered during the surveys, all work in the work area shall be placed on hold while the findings are reported to the CDFG and USFWS and it is determined what, if any, further actions must be followed to prevent possible take of this species.
>
> Mitigation Measure BIO-7b: Where construction would occur in habitat where California red-legged frogs, foothill yellow-legged frogs, and northwestern pond turtle are potentially present, work areas shall be fenced in a manner that prevents equipment and vehicles from straying from the designated work area into adjacent habitat areas. An authorized biologist shall assist in determining the boundaries of the area to be fenced in consultation with the USFWS, and CDFG. All workers shall be advised that equipment and vehicles must remain within the fenced work areas.
>
> The authorized biologist shall direct the installation of the fence and shall conduct biological surveys to move any individuals of these species from within the fenced area to suitable habitat outside of the fence. Exclusion fencing shall be at least 24 inches in height. The type of fencing must be approved by the authorized biologist, the USFWS, and CDFG.
>
> Mitigation Measure BIO-7c: If, at any time, individuals of these species are found within an area that has been fenced to exclude these species, activities shall cease until the authorized biologist moves the individuals.
>
> Mitigation Measure BIO-7d: If any of these species are found in a construction area where fencing was deemed unnecessary, work shall cease until the authorized biologist moves the

individuals. The authorized biologist in consultation with USFWS and CDFG shall then determine whether additional surveys or fencing are needed. Work may resume while this determination is being made, if deemed appropriate by the authorized biologist.

Mitigation Measure BIO-7e: Clearance surveys of the construction area shall occur on a daily basis in the work area. Any individuals of these species found during clearance surveys or otherwise removed from work areas shall be placed in nearby suitable, undisturbed habitat. The authorized biologist shall determine the best location for their release, based on the condition of the vegetation, soil, and other habitat features and the proximity to human activities. The authorized biologist shall have the authority to stop all activities until appropriate corrective measures have been completed.

Mitigation Measure BIO-7f: To ensure that diseases are not conveyed between work sites by the authorized biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force[55] shall be followed at all times.

Mitigation Measure BIO-7g: Project activities shall be limited to daylight hours, except during an emergency, in order to avoid nighttime activities when California red-legged frogs may be present.

Mitigation Measure BIO-7h: Within the work zone, traffic speed shall be maintained as required by the Manual of Uniform Traffic Control Devices – California edition. The speed limit in the work zone shall be no more than 15 MPH.

Mitigation Measure BIO-7i: BMPs and erosion control methods, as outlined in the project's SWPPP, shall be implemented. These BMPs include re-vegetation of all bare soil prior to the rainy season to prevent an increase in sediment entering waterways. The project's SWPPP shall be subject to the review and approval of the USFWS and CDFG.

Significance After Implementation. Implementation of Mitigation Measures BIO-7a through BIO-7i will reduce potential impacts to amphibian and reptile species to ***less-than-significant*** levels.

Impact BIO-8: Implementation of the proposed project could impact special-status mammal species potentially present within the project area. (S)

Pallid, Townsend's Big-Eared, and Western Red Bat. Implementation of the proposed project could potentially result in impacts on roosting and maternity sites used by pallid, Townsend's big-eared, and western red bats. Removal of redwood trees under the proposed project and Option A, and an oak tree under Option A could result in the removal of potential roosting and maternity sites. The removal of active roosting or maternity sites would be considered a significant impact.

Mitigation Measure BIO-8a: All trees to be removed within the project area shall be surveyed for the presence of bat roosts by a qualified biologist. Surveys may entail direct inspection of the trees or nocturnal surveys. The survey shall occur no more than 2 weeks prior to the initiation of vegetation removal and ground disturbing activities. The survey shall be

[55] http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/DAFTA.pdf

conducted prior to the commencement of the bat maternity season (approximately April 15-August 15). If no roosting habitat is present, then the tree must be removed within 1 week following the survey.

If roosting habitat is present and occupied, then a qualified biologist shall determine the species of bats present and the type of roost (i.e., day roost, night roost, maternity roost). If it is determined that the bats are not a special-status species, and that the roost is not being used as a maternity roost, then the bats may be evicted from the roost using methods developed by a biologist experienced in developing and implementing bat mitigation and exclusion plans.

Mitigation Measure BIO-8b: If special-status bat species are found to be present or if the roost is determined to be a maternity roost for any species of bat, then a qualified biologist experienced in developing bat mitigation and exclusion plans shall develop a mitigation plan to compensate for the lost roost site.

Removal of the roost shall only occur when the mitigation plan has been approved by CDFG and only when bats are not present in the roost. The mitigation plan shall detail the methods of excluding bats from the roost and the plans for a replacement roost in the vicinity of the project site. One replacement roost shall be provided for each roost impacted. The mitigation plan shall be submitted to CDFG for approval prior to implementation. The plan shall include: (1) a description of the species targeted for mitigation; (2) a description of the existing roost or roost sites; (3) methods to be used to exclude the bats if necessary; (4) methods to be used to secure the existing roost site to prevent its reuse prior to removal; (5) the location for a replacement roost structure; (6) design details for the construction of the replacement roost; (7) monitoring protocols for assessing replacement roost use; (8) a schedule for excluding bats, demolishing of the existing roost, and construction of the replacement roost; and (9) contingency measures to be implemented if the replacement roosts do not function as designed.

Mitigation Measure BIO-8c: Roosts shall only be removed during seasons when bats are active and the young are able to fly (March 1 – April 15, and August 1 – October 15).

Mitigation Measure BIO-8d: Removal of trees surrounding roost trees shall be conducted in a manner to prevent the tree being removed from falling on or otherwise damaging the roost tree.

Mitigation Measure BIO-8e: No diesel or gas-powered equipment shall be stored or operated directly beneath a roost site.

Mitigation Measure BIO-8f: Under supervision of a qualified bat expert, roost trees shall be removed in two steps, over two successive days:

1. Branches and limbs identified by the bat expert should be removed on Day 1 (Disturbance).
2. The remainder of the tree should be removed on Day 2 (Removal).

Mitigation Measure BIO-8g: All construction activity in the vicinity of an active roost shall be limited to daylight hours.

American Badger. Implementation of the proposed project could potentially result in impacts on individual American badgers or their dens if they are present within the project disturbance zone and areas immediately adjacent to the disturbance zone. Direct impacts (mortality of individual badgers, crushing of potential or occupied dens) to American Badgers could result during grading activities related to shoulder widening, installation of bioswales, installation of retaining walls, drainage improvements, decommissioning and creation of pullouts for cars, and during slide repair activities at Station 270+25. Direct impacts could also result if construction equipment were to travel outside of defined construction work zones.

Indirect impacts could result if potential or known dens are located in areas adjacent to the disturbance zone. Noise and the presence of construction equipment and personnel could cause the abandonment of active dens should they be present adjacent to the disturbance zone. It should be noted that no American badgers or potential dens were identified in the project disturbance zone of the project during field surveys. However, the potential exists that American badgers could become established within or adjacent to the project disturbance zone prior to project implementation. Impacts to individual American badgers or potentially active/active den sites would be considered a significant impact. Badgers dig their own dens and, therefore, the dens are not a limited resource that cannot be reconstructed. Avoidance of natal dens must be included in the mitigation (as described below).

Mitigation Measure BIO-8h: A preconstruction survey of the project area and the area within 100 feet of the project areas shall be conducted for the presence of the badger dens and signs of badger occupancy. The survey shall be completed no more than 7 days prior to the initiation of vegetation removal and ground disturbing activities. If no dens are observed, a second survey shall be conducted within 24 hours of vegetation removal and ground disturbing activities to ensure that no badgers have entered the area since the first survey. Preconstruction surveys shall be repeated as necessary if vegetation removal and ground disturbing activities are delayed or postponed.

Mitigation Measure BIO-8i: If potential dens are observed within the project area or 100-foot buffer area, then the project shall implement a monitoring program to determine if the dens are active. Monitoring shall be performed using remote triggered cameras or tracking medium placed at the den entrance. Cameras or tracking medium shall be operated for a minimum of three nights. If no activity is observed at the den during the monitoring period, the den shall be excavated by hand on the morning following the third night of monitoring. The den shall be backfilled to prevent reuse. All den excavations shall be coordinated with the CDFG. If a den is determined to be active, the den shall be monitored for an additional 3 nights to determine if the badgers are using the den continually. Special care shall be taken during the period of March through July when badger cubs may be present in the den. Excavation of natal dens shall not be allowed until it is determined by a qualified biologist that the young have left the den and are able to forage independently. The presence of a natal den within the project area or buffer area shall be reported to CDFG within 24 hours.

Mitigation Measure BIO-8j: During all times of the year, no excavation of the dens shall be allowed until monitoring results demonstrate that the den has been unoccupied for at least three nights. Once the den has been determined to be unoccupied for a period of at least three nights, the den may be excavated by hand and backfilled.

Mitigation Measure BIO-8k: Outside of the period when young may be present in the den (August through February), measures may be taken to discourage the use of continually occupied dens. This discouragement may include blocking the entrance to the den or other methods approved by CDFG. The den must be continually monitored during this period to ensure that badgers are not occupying the den. Excavation and backfilling may occur once the den is determined to be unoccupied for at least three nights. A report documenting the results of preconstruction surveys and den monitoring shall be reported to CDFG within two weeks of completion of the den excavations and initiation of vegetation removal and ground disturbance activities.

Significance After Implementation. Implementation of Mitigation Measures BIO-8a through BIO-8k will reduce potential impacts on special status mammal species to ***less than significant*** levels.

Impact BIO-9: Implementation of the proposed project would impact native trees protected by the Marin County Tree Preservation Ordinance present within the project area. (S)

The proposed slope stabilization work at Station 270+25 would require the removal of eight native trees (five California bays and three coast redwoods) that are protected under the County Tree Protection Ordinance -Marin County Code Chapter 22.27 (see Table A of the *Biological Assessment* - Appendix E). Additionally, under Option A the proposed project would require the removal of nine native trees (eight redwoods and one coast live oak – see Table A of the *Biological Assessment* - Appendix E). Eight of the trees (all redwoods) to be removed under Option A are relatively mature with canopy heights ranging from 70 to 120 feet.

Marin County Code Chapter 22.27 provides protection for native trees (including oaks, bays and redwoods) that have specified minimum diameters. All of the trees that would be removed under the proposed project and Option A exceed the minimum diameters under the Code and are therefore protected.

Tree removal at Station 270+25 and under Option A would have several potential biological impacts:

1. **Bird habitat impacts.** All of the affected trees are of sufficient size to provide suitable nesting habitat for birds protected under the MBTA, as well as roosting and foraging habitat for a variety of native bird species that use the Lagunitas Creek corridor.
2. **Stream shading impacts.** Tree removal could result in reduced shading of the aquatic environment in the creek, which could adversely affect water temperatures and the related suitability for salmon and steelhead spawning, rearing and emergence. Four of the trees that would be removed at Station 270+25 (Trees 1, 2, 7 and 8 in Table A of the *Biological Assessment* - Appendix E) and three of the trees that would be removed under Option A (Trees 7, 8 and 9 in Table B of the *Biological Assessment* - Appendix E) are canopy-sized trees situated so that they provide shading of Lagunitas Creek for at least part of the day. Given the limited amount of shade

effects of these trees and the proximity of other large canopy trees in these locations, the shading impacts is unlikely to be significant

3. **Ground shading impacts.** The loss of ground shading from all affected trees would also open up areas of the upper stream bank to colonization by invasive exotic plant species.
4. **Large woody debris impacts.** The trees to be removed at Station 270+25 and five of the trees to be removed under Option A are located on the Lagunitas Creek side of SFDB and therefore have the potential to provide beneficial woody debris to the creek system.

Relative to the large number of trees occurring along the SFDB corridor (1,368 trees with diameters of 6 inches or greater were surveyed within 20 feet of the pavement) and the vastly greater number of tree occurring in the adjacent woodland and forest communities on either side of SFDB, the loss of nine trees under Option A and eight trees at Station 270+25 would not likely result in any of the above impacts being biologically significant on a watershed basis. Nevertheless, these impacts could be locally significant and also require compensatory mitigation actions under the County tree protection ordinance.

Mitigation Measure BIO-9a: Marin DPW shall comply with the requirements of the Marin County Tree Protection Ordinance for any tree loss under the proposed project including retaining wall work at Station 270+25 and all tree removal under Option A. Consistent with the ordinance, trees of the same species as those impacted shall be replanted at a 3:1 replacement ratio. The replacement trees shall be 15-gallon specimens unless a certified arborist or a representative from the MMWD determines otherwise. Planted trees shall be maintained with browse protection and weed cloth around the root zones as needed, and regularly watered during the dry season until such time that a certified arborist has determined that they are sufficiently established to not require further maintenance or watering.

Replanted trees shall be planted within the Lagunitas Creek watershed if possible. One suitable location for tree replanting is the drilled-pier retaining wall structure located immediately downstream from the Peters Dam plunge pool (see Biological Assessment – Appendix E). MMWD constructed this wall to protect a pipeline that was endangered by a landslide along a 160-foot section of stream bank in 2005. MMWD would like to replant the stream bank below the retaining wall with native trees and shrubs, including redwood trees. The area to be planted would qualify as mitigation if Marin DPW paid for or did the planting.

Prior to the start of roadway construction, DPW shall identify the final planting location(s) and receive approval from MMWD if necessary. If suitable re-planting location(s) cannot be found and agreed to by the affected public agency property owners, then DPW may contribute the required monetary amount into the Marin County Tree Preservation Fund, as specified under the tree protection ordinance.

Mitigation Measure BIO-9b: In order to compensate for the potential habitat impacts from tree removal along Lagunitas Creek, Marin DPW shall implement the following additional mitigation measures:

- Marin DPW shall provide a financial contribution to the MMWD for support of habitat enhancement along Lagunitas Creek under the MMWD *Mount Tamalpais Watershed*

Gateway Project. The appropriate amount of the contribution shall be directly related to the degree of removed habitat and shall be determined by Marin DPW in consultation with MMWD and shall be specifically dedicated to either invasive exotic vegetation management and/or native plant revegetation efforts along the creek.

- Marin DPW shall make available suitable cuttings from the tree removal work for use as woody debris and in bio-engineered structures along Lagunitas Creek in order to enhance salmonid habitat. The Marin DPW shall notify the signatories to the February 7, 2007 *Memorandum of Understanding for Woody Debris Management in Riparian Areas of the Lagunitas Creek Watershed* (Marin Municipal Water District, Marin County Open Space District, California Department of Parks and Recreation, National Park Service, and the Marin County Resource Conservation District – see *Biological Assessment* - Appendix E) of the availability of the wood, and the signatories shall notify Marin DPW if they have use for the woody debris, and when they will collect the material. If the signatory agencies have not responded within 14 days Marin DPW shall dispose of the material in a legal manner.

Significance After Implementation. The implementation of Mitigation Measures BIO-9a and 9b will reduce the impacts of tree removal habitat loss to ***less-than-significant*** levels.

Impact BIO-10: Project construction could impact roots of redwoods and other native trees present within the project area. (S)

Project construction could cause indirect impacts to native trees that occur along the edge of SFDB within the project work zone. These impacts could include root zone damage from soil compaction, soil excavation, root pruning, adding fill or concrete directly on roots, and altering drainage patterns. Native trees occurring along SFDB that could be potentially affected by these work activities include coast redwood, coast live oak, tanbark oak, California bay, buckeye, big leaf maple, Douglas fir and white alder.

The majority of trees potentially affected by the project are coast redwoods. As discussed in the *Biological Assessment* (Appendix E), the coast redwood has a unique root system that lacks a tap root but rather has a shallow network of lateral roots that extend from the base of the trunk. This root system provides the species with a relatively high level of resiliency from natural disturbances. Younger trees may be less resilient than older trees (>400 years) from damage and disturbance to the root system. The extent to which this resiliency may afford protection from indirect project impacts is not known, however the Biological Assessment notes that the majority of redwoods along SFDB are second growth, no older than 150 years.[56] The Biological Assessment states that regardless of this potential level of resiliency, cumulative effects from multiple disturbances could be problematic for trees along the project work zone. Project disturbance effects to redwoods would not necessarily be apparent in the immediate aftermath of construction work, but rather could take could take five to ten years or longer before they are observable. Symptoms of these impacts could include stunted growth, increased susceptibility to disease, die back, and felling, among others. Based on all these

[56] Synthesis Environmental Planning (SEP). 2008. Approximate age of Redwood Trees along Project Alignment, Sir Francis Drake Boulevard Reconstruction Project, Marin County, California. Letter Report to Marin County Public Works Dept., May 30, 2008.

considerations, damage to roots of all trees including coast redwoods along the SFDB project work zone should be minimized to the maximum extent practicable.

Potential indirect tree impacts are described in more detail below:

- **Soil compaction.** Compacting soil increases bulk density and reduces pore space. As a consequence, less oxygen, water, and mineral exchange occurs in compacted soils, which can lead to root death. Root death, if extensive enough, can lead to canopy die-back and/or structural failure.[57] [58] In addition, seedlings are less likely to recruit in compacted soils.[15] Project activities that may result in soil compaction include: "crack and seat" work along SFDB Segment 1 that will compress and interlock broken-up concrete panels into the sub grade; grinding and compaction of concrete and asphalt along Segments 2 and 3; and movement of heavy earthmoving equipment, construction vehicles and other heavy machinery in and adjacent to the work zones.
- **Soil excavation and root pruning.** Damage to roots from soil excavation or root pruning can have various impacts. Pruning of fine roots will decrease a tree's water and nutrient absorption capacity; however this impact is not likely to be significant because annual root growth ensures that this loss, if only to a small portion of a tree's root system, may be minor and temporary. Damage to larger roots, especially those 1-inch in diameter or greater, risk causing structural failure that increases the chance of felling, especially during strong winds. Damage to larger roots also have a greater impact on water and nutrient physiology that will likely lead to canopy die-back since, in general, the larger a root, the greater amount of fine roots that are connected to it. Indirect effects to physical root damage from excavation include heightened susceptibility to disease.[59]

  Project activities that may result in root damage from soil excavation and root pruning include: the grinding and removal of the old asphalt layer along SFDB Segments 2 and 3; soil excavation incidental to culvert replacement work; and soil exaction for retaining wall construction.
- **Concrete and fill placement atop root zones.** Pouring concrete and other foreign materials on roots can change soil drainage patterns and restrict access to soil resources (e.g., minerals, water, and oxygen) that could lead to root death.[60] Replacing natural soil with fill also dramatically alters the environment around the affected root. Impacts of adding fill over roots are similar to those associated with soil compaction and pouring concrete on roots, and will vary depending on the type of fill used.

  Project activities that may result in concrete and other fill placement over root zones include: backfilling of asphalt removal areas with an aggregate base; paving of currently unpaved road shoulders and pullouts with asphalt or rubberized asphalt concrete material; and temporary storage of fill materials in project staging areas.

[57] Coder, K. D. 2000. Soil Compaction Impacts on Tree Roots. University of Georgia Warnell School of Forestry Resources Extension Publication. July 2000 [online] http://www.forestry.uga.edu/efr
[58] Watson, G. W. and P. Kelsey. 2006. The impact of soil compaction on soil aeration and fine root density of Quercus palustris. Urban Forestry and Urban Greening 4:69-74.
[59] Evans, E. 2000. Trees: Damage. North Carolina State University. http://www.ces.ncsu.edu/depts/hort/consumer/factsheets/trees-new/text/tree_damage.html#construction
[60] McPherson, E. G., G. Gonzalez, G. Monfette, and R. Lorenzen. 2004. Street Trees of Los Angeles. City Trees 90:6-12.

- **Alteration of drainage patterns.** Major alteration of drainage patterns from construction can detrimentally affect tree health. Sudden lack of resources (e.g., water) from altering existing drainage patterns could result in root stress. In addition, changes that increase pooling of water in the otherwise, well drained soils of the project area also risk causing root failure due to formation of anoxic conditions.

  Project activities that may result in alterations of drainage patterns in the vicinity of tree roots include: the construction of subdrain bioswales along road shoulders; and the filling of roadside swale and drainage ditches for roadway alignment and width improvements.

  Mitigation Measure BIO-10a: An arborist certified by the International Society of Arboriculture (ISA) shall be present for any ground disturbing construction activities within a 50-foot radius of any redwood tree and within the dripline of other native trees to monitor compliance with Mitigation Measures BIO-10b through 10i.

  Mitigation Measure BIO-10b: All excavation work below the finish grade within a 50-foot radius of any redwood tree shall be done with hand tools or with light mechanized equipment such (e.g., mini or light excavator or backhoe) to minimize disturbance or damage to roots.

  Mitigation Measure BIO-10c: The contractor shall use an air spade while excavating the soil within the structural root zone of native trees to minimize physical injury to the tree roots. The contractor may propose alternative excavation methods that would minimize root damage, subject to the approval of the certified arborist and Marin DPW.

  Mitigation Measure BIO-10d: Smaller roots less than 2-inches in diameter requiring cutting shall be cut cleanly in order to promote healing.

  Mitigation Measure BIO-10e: The structural section for new pavement shall consist of Cement Treated Permeable Base (CTPB) or the equivalent to minimize the thickness of the structural section, minimize compaction of roots, and minimize thermal exposure to roots.

  Mitigation Measure BIO-10f: In areas where soil would be excavated through the roots of native trees for culvert replacement, retaining wall construction or other purposes, the following measures shall be used to protect roots and promote air circulation:

  - The existing vegetation needing removal shall be cut flush with the ground and stumps left in place. Stumps shall not be treated with herbicides or other chemicals.
  - Any duff layer shall be hand raked off the area within the clearing limits, stored, and replaced as erosion control.
  - A 0.75 foot thick layer of Class 1, Type A porous material shall be placed and compacted as the first lift of the fill to increase water infiltration and air circulation. A layer of filter fabric shall then be applied prior to placing the remaining fill required for the embankment.
  - In locations where fill would be placed next to the trunk of a redwood tree greater than three feet in diameter, a brow log shall be used to keep the soil from the tree trunk to increase air circulation.

Mitigation Measure BIO-10g: Equipment staging areas/storage areas shall be on existing paved areas on existing areas of compacted, gravel surface not located within 50 feet of redwood trees.

Mitigation Measure BIO-10h : No heavy equipment shall be staged or parked within the drip line of mature trees in unpaved areas. Fill, gravel or other construction materials shall not be stockpiled within 50-feet of redwood trees or beneath the driplines of any other trees.

Mitigation Measure BIO-10i: In order to avoid adversely altering surface drainage patterns over redwood root zones, bioswales and other drainage swale features shall be located on the upslope side of SFDB (opposite side from Lagunitas Creek) wherever feasible.

Significance After Implementation. Implementation Mitigation Measures BIO-10a through BIO-10i will reduce the level of impact on redwood roots and other tree roots to ***less than significant***.[61]

Impact BIO-11: Implementation of the proposed project would impact seasonal wetlands and other waters present within the project area. (S)

The project would result in direct, permanent impact to approximately 0.24 acre of roadside swale seasonal wetlands that would be filled as a result of road widening, shoulder improvements and bioswale construction in the locations shown in the *Biological Assessment* (Appendix E). On a seasonal basis when extended period of inundations occur, these wetlands may provide suitable habitat for aquatic invertebrates and amphibians, and feeding and foraging habitat for common wildlife species. However the feeding and foraging value of this habitat is probably diminished by the physical narrowness of the swales and the very close proximity of SFDB and its associated vehicular traffic. In the absence of mitigation measures, loss of this habitat would be a significant impact.

These wetlands may also provide water quality functions by detaining runoff and absorbing or uptaking pollutants. However the value of this function is limited since the swales were not designed for this purpose (e.g., substrates not suitable, not physically designed to optimize detention). This function would be replaced and improved under the project by the construction of roadside bioswales specifically designed for water quality treatment.

Culvert replacement work would temporarily impact 2,308 linear feet of culverted stream channels. These temporary impacts would be limited to the culvert replacement work beneath the roadbed and road embankment and would not affect any natural stream channel bed or bank below the OHWM.

The project would also temporarily disturb stream bank areas above the OHWM in locations where the culvert replacement work would include the placement of rock riprap or erosion fabric below culvert outlets for erosion prevention purposes. An estimated 4,500 square feet (280 linear feet) of stream bank would be temporarily disturbed in this manner. The project would also temporarily disturb 1,800 square feet (60 linear feet) of stream bank above the OHWM at Station 270+25 where the slope repair retaining wall would be constructed.

[61] Adapted from Caltrans (2008).

Implementation of the project could also lead to the release of silt and sediment, turbidity and other construction related pollutants into areas adjacent to the construction zone, which could in turn drain into wetlands and streams, thus indirectly impacting water quality and biota in wetlands and streams (see Impact BIO-5 for discussion of biological impacts and mitigation measures related to water quality).

Permanent and temporary impacts to wetland and stream resources would be considered a significant impact.

Mitigation Measure BIO-11a: Prior to project implementation, Marin DPW shall obtain all required regulatory permits to conduct work activities in wetlands and streams. Permits required to conduct these activities include a Section 401 Water Quality Certification from the Regional Water Quality Control Board (RWQCB), a Section 404 permit from the USACE, and a Lake and Steambed Alteration Agreement from CDFG.

Mitigation Measure BIO-11b: Marin DPW shall compensate for the loss of 0.24 acres of seasonal wetlands associated with the filling of roadside swales by establishing new seasonal wetlands at a 2:1 on-site replacement ratio within the Lagunitas Creek watershed in the vicinity of the SFDB project. One possible mechanism for accomplishing this may be for the DPW to fund the establishment of at least 0.48 acres of new floodplain wetland habitat along Lagunitas Creek in association with the MMWD *Lagunitas Creek Salmon Winter Habitat Enhancement Program*. This program seeks to address a possible limiting factor to the survival of juvenile coho salmon - a lack of suitable winter habitat along the creek, by establishing new side channels and backwater wetlands on selected reaches of the floodplain. The following is a brief summary of the proposed mitigation plan:

- **Mitigation Location.** Tocoloma Reach of Lagunitas Creek, just west of Platform Bridge Road, approximately 1,100 feet north of SFDB.
- **Mitigation Site.** An approximately 1.2-acre abandoned floodplain area adjacent to Lagunitas Creek. The site is characterized by disturbed grassland and ruderal (weedy) vegetation formerly used for cattle grazing, and contains abandoned grazing infrastructure (e.g., corrals, feeding troughs) as well as small areas of fill that would need to be removed. The site is generally flat with elevations ranging from approximately 62 – 63 feet NGVD. Soils are mapped as stratified depositions of sand, gravel, cobbles and stones with ephemeral depositions of silt and sandy loam, as is typical of floodplains along the creek ("Fluvents, channelized" under Soil Conservation Service Soil Survey maps).

  The proposed mitigation site was selected by MMWD for the following reasons: (1) the site has floodplain topography and substrate conditions suitable for backwater channel creation; (2) the site is currently disturbed and does not support woody riparian habitat or wetlands; and (3) the site is publicly-owned (by the NPS) and is easily accessible to construction equipment due to it proximity to Platform Bridge Road.
- **Mitigation Approach.** The proposed plan is intended to be one element of the overall Winter Habitat Enhancement Program, which would include various winter habitat enhancement efforts along Lagunitas Creek from the Shafter Bridge downstream to Olema Creek. The overall goal of the plan is to establish an approximately 1,200-linear

foot, 30-foot wide backwater channel that would establish approximately 0.8 acres of suitable over-wintering habitat for coho salmon juveniles and smolts. The channel would have upstream and downstream connections to Lagunitas Creek and would have a bottom elevation that intercepts baseflows during the winter and early spring based on historical flow records in Lagunitas Creek. Channel cross sections would be modeled after existing backwater channel habitat in Lagunitas Creek and in similar coastal streams elsewhere, and would include gentle sideslopes suitable for the establishment of emergent marsh, seasonal wetland and woody riparian vegetation encompassing at least 0.5 acres. A key design element would be to ensure that salmonids are able to swim into and out of the backwater habitat and not become stranded during lower flows. The backwater habitat enhancement design would also include refuge and cover habitat features for salmonids (e.g., woody debris structures and undercut bank sections).

- **Funding Status.** The project has received funding only for detailed topographic surveys, site assessment work and construction plan preparation. The project does not have funding for regulatory approval, construction or follow-up monitoring and management. As mitigation for the SFDB project, the DPW proposes to provide the required funding and/or in-kind services for regulatory approval, construction and follow-up monitoring and management to allow the project to be implemented.
- **Schedule.** The MMWD would be selecting an engineering contractor to conduct hydrologic modeling analysis and to prepare the construction plans, as well as to conduct the related, site specific topographic survey and site assessments. Construction plans are scheduled to be completed by July 2011. The PWD would prepare and submit the Mitigation and Monitoring Plan in accordance with Corps of Engineers, Regional Water Quality Control Board and California Department of Fish and Game requirements as part of the wetland/streambed alteration permit applications for the SFDB Rehabilitation project. Implementation of the plan would occur prior to or simultaneous with the commencement of construction work for the SFDB Rehabilitation project.

Project construction, including filling of roadside swales shall not start until a suitable wetland mitigation site has been selected and a Wetland Mitigation and Monitoring Plan for the site has been prepared by Marin DPW and approved by the Corps, RWQCB and CDFG. Mitigation construction work under the plan shall be completed in accordance with a timetable agreed to by these three agencies.

Mitigation Measure BIO-11c: Marin DPW shall minimize temporary disturbances to streambanks to the smallest amount feasible needed to accomplish culvert replacement, bank stabilization and slope repair work. Marin DPW shall restore disturbed areas to pre-disturbance conditions after temporary project activities are complete. Seed mixes for stabilization of disturbed areas shall consist of species native to Marin County. Fertilizers shall not be applied with any seeding or as part of hydroseed mixes.

Mitigation Measure BIO-11d: Disturbance of stream channels in the project site shall be limited to the minimum necessary to complete proposed drainage improvement activities. Riparian vegetation shall be trimmed (and not removed) where feasible, and where removal is necessary, should be at the minimum necessary to complete work. Stream channels shall be re-vegetated with appropriate riparian vegetation after work activities are completed. All re-

vegetation activities shall be approved by CDFG under the Streambed Alteration Agreement process prior to restoration activities being completed.

Mitigation Measure BIO-11e: A qualified biologist shall be present during any work occurring within wetlands or streams.

Mitigation Measure BIO-11f: DPW shall implement all water quality protection measures contained in the SWPPP to prevent the direct and indirect release of soil and other construction materials into wetlands and streams.

Significance After Implementation. Implementation of Mitigation Measures BIO-11a through BIO-11f would reduce impacts on seasonal wetlands and other waters in the project area to ***less-than-significant*** levels.

Impact BIO-12: Implementation of the proposed project could induce the spread of panic veldt grass and other non-native invasive plants to previously un-infested areas within the project area. (S)

Panic veldt grass, as well as other invasive non-native plant species, were identified along the edges of SFDB during botanical surveys conducted by Molly Boyes Botanical Consulting in 2007. Grading activities within the project disturbance zone have the potential to spread these invasive plant populations beyond their current locations. If these non-native invasive plant populations are spread into areas where native vegetation communities are present, they could outcompete native plants and special-status plant species potentially present. This impact would be considered significant.

Marin DPW shall implement the following mitigation measure to avoid spreading invasive weed species in the vicinity of the project site:

Mitigation Measure BIO-12a: Prior to project implementation, Marin DPW shall remove populations or individuals of invasive plants listed by the California Invasive Plant Council (CalIPC) with ratings of A or B for impacts and invasiveness from areas of the project site where the ground surface would be disturbed and vegetation removed. Removal activities shall be conducted under the supervision of a botanist qualified in the identification of invasive weed species. Invasive weed removal shall be conducted prior to seed set (as determined by monthly spring surveys by a qualified botanist) to minimize the spread of invasive weed seeds in the project site. If it is not possible to remove weeds prior to seed set, measures to minimize the release of invasive weed seeds during weed removal (e.g., manual weed removal into plastic bags) shall be used.

Mitigation Measure BIO-12b: If hay bale installation is necessary for erosion-control in the project area, only certified weed-free hay bales shall be used.

Mitigation Measure BIO-12c: Construction equipment, particularly wheels and tracks, shall be cleaned prior to entering the project site to prevent the spread of invasive weeds from areas outside of the project site. Cleaning shall be achieved by rinsing equipment with water or using high-pressure air.

Mitigation Measure BIO-12d: When re-vegetation of bare soil surfaces is required, Marin DPW shall utilize a native seed mix pre-approved by CDFG and reviewed by CNPS.

Significance After Implementation. Implementation of Mitigation Measures BIO-12a through BIO-12d would reduce the potential for the spread of panic veldt grass and other non-native invasive plants to previously un-infested areas within the project area to ***less-than-significant*** levels.

4.4 CULTURAL RESOURCES

This section describes existing conditions for cultural and paleontological resources within the project vicinity, as well as potential impacts to those resources that could occur due to project implementation. The evaluation is based on review of existing documents, Native American contacts, and field surveys. This section describes existing conditions for cultural and paleontological resources within the project vicinity, and assesses potential impacts to those resources that could occur due to project implementation. Feasible mitigation measures are presented for potentially significant impacts.

4.4.1 Setting

Pacific Legacy, Incorporated (Pacific Legacy), an archaeological consulting firm, conducted an archaeological survey of the project area, defined here as the County right-of-way from Platform Bridge Road to Shafter Bridge.[62] The County right-of-way in the project area extends 30 feet in both directions from the centerline of SFDB. Pacific Legacy conducted background research and a field survey, contacted potentially interested parties, and recorded resources in 2007 and 2009. Project representatives and officials from the County met with Nick Tipon, a representative of the Federated Indians of Graton Rancheria, on March 5, 2009. The meeting was held to discuss the project and its potential impacts to cultural resources. Pacific Legacy surveyed the project area to the greatest extent feasible given the constraints posed by impassable vegetation or extreme slopes. A complete description of their methods is provided in an Archaeological Survey Report.[63]

LSA Associates, Inc. (LSA) conducted archival review and background research to characterize the paleontological sensitivity of the project area. Archival review and background research consisted of a fossil locality search at the University of California, Museum of Paleontology on October 2, 2009, and a review of pertinent geological and paleontological literature.

Human Settlement of the Project Area. While a number of coastal sites in California have yielded clues to the region's earliest inhabitants, only a few isolated finds in Marin County can be attributed to Paleo-Indian occupation[64] dating to more than 10,000 years ago. This paucity of evidence may be the result of sedimentation and sea-level changes that have inundated many early coastal sites, rather than a lack of early settlement in the peninsula. By about 2,500 years before present (B.P.), Proto-Miwokan people already inhabited the coastal areas of the Marin Peninsula, perhaps after expanding from the shores of the San Francisco Bay to neighboring regions due to increased competition for resources and changing climatic conditions.[65] Many of the major village sites in Point Reyes and along the Marin bay shore were first occupied during the period of about 1,000 B.P.[66] By about 500 B.P., the territories and lifeways of the Native Californian groups encountered by early European settlers were more or less in place.

[62] Pacific Legacy, Incorporated, 2009. *Archaeological Survey Report for the Sir Francis Drake Boulevard Improvements Project, Marin County, California.* Berkeley, California.
[63] Ibid.
[64] Stewart, S. B., 2003, p. 114). An Overview of Research Issues for Indigenous Archaeology. In *Archaeological Research Issues for the Point Reyes National Seashore – Golden Gate National Recreation Area*. On file at the Division of Cultural Resources and Museum Management, Golden Gate National Recreation Area, National Park Service. San Francisco, California.
[65] Steward, op. cit., pp. 116-117.
[66] Ibid, p. 118.

Coast Miwok. The project area is located within the territorial boundaries of the Coast Miwok. Prior to the arrival of Europeans to the San Francisco Bay Area, Coast Miwok territory included the entire Marin Peninsula and stretched as far north as Duncan's Point and as far east as Sonoma. Linguistically, Miwok is one of the California Penutian languages and comprises several groups including Coast Miwok. Pre-contact population estimates for the Coast Miwok suggest that population density was low, with perhaps as few as 2,000 people living in the entire area.[67]

The settlement patterns of the Coast Miwok, similar to other native groups in the region, were largely dictated by the seasonal availability of important food resources. During the warmer summer months, villages were occupied along rivers, estuaries, and the coast. Winter villages were often located further inland and contained semi-permanent structures and food storage facilities.[68] Settlements consisted of conical dwellings that were constructed of wood or bark and covered with grass. Large villages existed that contained semi-subterranean sweathouses and other ceremonial structures.[69]

The Coast Miwok created a diverse array of material culture. Since pottery was not used by most Native Californians, basketry was of particular importance and served a number of purposes including, cooking, serving, parching, carrying, and storage. Although baskets were primarily utilitarian in nature, some were multicolored and sported feather and shell ornaments. Lupine roots were used to make cordage for nets, and wooden objects included foot drums and paddles for use with the tule balsa, an important watercraft. Weaponry consisted of the bow and arrow, as well as the sling and a bola for hunting waterfowl. Arrow points were typically made from obsidian, although chert was used to make different types of flaked stone tools. Other types of stone were used as mortars and pestles.[70] Shell was another important material, with abalone, in particular, commonly used for ornamentation.

Early Coast Miwok and European Contact. The first contact between Coast Miwok and Europeans occurred over 400 years ago. This event presumably took place in 1579 when Sir Francis Drake made landfall somewhere in Coast Miwok territory, although the exact location of his landing is unknown. Drake remained in the area for six weeks marked by a number of amicable interactions with the local people. Sixteen years later, Sebastian Cermeño landed in what is today known as Drakes Bay. His galleon, the *San Agustin*, was wrecked by a storm, forcing Cermeño and his men to make the return trip to Acapulco by launch.[71] Even before they left, however, the Coast Miwok began salvaging items from the larger vessel, and the Chinese porcelains and metal objects they recovered have been noted in archaeological assemblages from throughout the area.[72]

[67] Kelly, Isabel, 1978. Coast Miwok. In *Handbook of North American Indians: Volume 8, California.* William C. Sturtevant, General Editor. Smithsonian Institution, Washington, D.C.
[68] Lightfoot, K.G., L.M. Panich, T.D. Schneider, and K.E. Soluri, 2009, p. 211). California Indian Uses of Natural Resources, in *California Indians and Their Environment: An Introduction* by K.G. Lightfoot and O. Parrish, California Natural History Guides, 96. University of California Press, Berkeley.
[69] Kelly, op. cit., p. 417.
[70] Kelly op. cit., pp. 417-418.
[71] Lightfoot, K.G. and W.S. Simmons, 1998. Culture Contact in Protohistoric California: Social Contexts of Native and European Encounters. *Journal of California and Great Basin Anthropology* 20(2):138-170.
[72] Schneider, Tsim, 2009. Point Reyes National Seashore Sites, Olompali and McClure Sites. In, *Archaeology in America: An Encyclopedia*, F.P. McManamon, general editor, pp. 65-68. Greenwood Publishing Group, Westport, Connecticut.

Early European Settlement to Present. In 1775, the Ayala expedition stopped at the Marin Peninsula in order to explore the area in advance of the founding of Mission Dolores and the Presidio of San Francisco in 1776.[73] Mission San Rafael was founded in 1817 and was home to many Coast Miwok families, although accounts from the Russian mercantile outpost at Colony Ross indicate that native people including Coast Miwok sought refuge there from the epidemic disease and directed enculturation of the mission system.[74] The Spanish missions were secularized in the mid-1830s, and the native people who had lived there were forced to fend for themselves in a dramatically changed world. Many Coast Miwok worked at nearby ranchos, such as General Mariano Vallejo's Rancho Petaluma.[75]

In the waning years of the Mission period, the Mexican government granted lands to numerous individuals in the greater San Francisco Bay area, including modern-day Marin County, serving as the land base for the vast rancho system that developed before California's entry into statehood. During this time, much of Marin was used to raise cattle for the hide and tallow trade. Rancho Nicasio was one such grant, and was slated for Teodosio Quilajuequi, a California Indian. The grant, however, was never patented, and by the 1840s and 1850s the lands of around Nicasio were largely owned by Americans.[76] Rancho Las Baulines and Rancho Tomales y Baulenes were among the other ranchos that operated in the area.[77] One famous *vaquero* of this period was Tom Wood, who served as an agent for Coast Miwok people raising cattle near Tomales Bay. Local historian Dewey Livingstone (personal communication) indicated that Tom Wood lived for a time during the 1820s-1830s near the present site of Samuel P. Taylor State Park.

Samuel P. Taylor, the son of a signer of the Declaration of Independence, was one of the first Anglo settlers near San Geronimo Valley. Having made a modest fortune in the Gold Rush, he purchased 200 acres of timberland from Rafael Garcia who had been granted the land by the Mexican government.[78] There, Taylor established a paper mill—the first of its kind on the west coast—along Lagunitas (also known as Papermill) Creek in 1856. The mill used waste paper and rags collected from the streets of Oakland and San Francisco to make newsprint for several papers in the area. Few roads existed in Marin at that time, and Taylor had to rely on pack trails from Bolinas and Tomales Bay to bring in supplies or to ship paper back to San Francisco.[79]

By the early years of the 20th century, the industrial activity in the area along Lagunitas Creek was all but over. The notable Bay Area poet, Kenneth Rexroth, often spent time in an isolated cabin during the 1930s and 1940s in an area that was incorporated into Samuel P. Taylor State Park in 1946.[80] Portions of the park, in fact, have significant historical associations such that they are eligible for

[73] Steward, op. cit., p. 189.
[74] Lightfoot, K.G., 2005. *Indians, Missionaries, and Merchants: The Legacy of Colonial Encounters on the California Frontiers*. University of California Press, Berkeley.
[75] Silliman, S., 2004. *Lost Laborers in Colonial California: Native Americans and the Archaeology of Rancho Petaluma.* University of Arizona Press, Tucson.
[76] Hoover, M. E., H. E. Rensch, E. G. Rensch, and W.N. Abeloe, 1990, pp. 179-180. *Historic Spots in California*. 4th edition, revised by D.E. Kyle. Stanford University Press, Stanford.
[77] Waghorn, A., 2003. An Overview of Research Issues for Historical Archaeology. In *Archaeological Research Issues for the Point Reyes National Seashore – Golden Gate National Recreation Area*. On file at the Division of Cultural Resources and Museum Management, Golden Gate National Recreation Area, National Park Service, San Francisco, California.
[78] California Department of Parks and Recreation, 2008. Brochure about Samuel P. Taylor State Park. Sacramento, California.
[79] Shafter, Payne J., 1929. Early Roads in Marin. *San Rafael Independent*, November 23.
[80] Miller, op. cit.

listing in the California Register of Historical Resources. The route of the former pack trails that brought the first non-native settlers to the region is now followed by SFDB.[81] Construction for the paved roadway began in 1926, and grading was finished the following year. The roadway was allowed to "settle" for two years before the concrete was poured. SFDB was officially opened and dedicated near the end of 1929, and has remained mostly unchanged and unimproved since that time.

Historical Records Review. A records search of the project area was conducted by the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) for Pacific Legacy and Synthesis Planning on October 2, 2007 (NWIC File No. 07-0489), and updated by the NWIC on August 21, 2009 (NWIC File No. 09-0183).

The records searches revealed that 11 cultural resources studies had been conducted within or adjacent to the project area. Five of these studies were conducted in the project area, while six of these studies were conducted adjacent to or within a mile of the project area

The records searches revealed that eight cultural resources have been recorded within or adjacent to the project area. The resources include two prehistoric lithic scatters (CA-MRN-479/P-21-000431 and CA-MRN-480/P-21-000432); a historical artifact concentration (CA-MRN-546H/P-21-000477); two locations with historical concrete or cement features (CA-MRN-547H/P-21-000478 and P-21-002538); the remains of one historical bridge (CA-MRN-548H/P-21-000479); one historical road complex (CA-MRN-551H/P-21-000482); and a historical railroad grade (CA-MRN-550H/P-21-000481) that crosses SFDB.

During the archaeological survey by Pacific Legacy in 2007, three new cultural resources were recorded. All of these resources were historical. These resources included SFDB and associated features; a refuse scatter (PL-SFD-02); and a house lot (PL-SFD-15).

The Pacific Legacy archaeological survey report provides detailed descriptions of the resources identified during the records search and archaeological survey.

Native American and Historical Society Contacts. On September 28, 2007, Pacific Legacy requested a search of the Sacred Lands Inventory maintained by the Native American Heritage Commission (NAHC) for the project area. A response was received on October 9, 2007, stating that no Native American cultural resources listed on the Sacred Lands Inventory were known to exist within the project area. The NAHC also provided Pacific Legacy with a list of Native American individuals with potential knowledge of the area.

Pacific Legacy sent letters via certified mail to persons on the NAHC list on October 11, 2007. The recipients, who were notified of the proposed project and its location, included Ya-Ka-Ama; Gene Buvelot, Frank Ross, Greg Sarris, Kathleen Smith, and Nick Tipon of the Federated Indians of Graton Rancheria. Nick Tipon of Federated Indians of Graton Rancheria responded affirmatively to the letter and met with County representatives on May 3, 2009, regarding the project. Mr. Tipon requested the technical report of the biological survey of the project area, which was sent to him by Pacific Legacy. In addition, Pacific Legacy wrote Mr. Tipon on May 14, 2009, inviting representatives of the Federated Indians of Graton Rancheria to conduct a field visit while Pacific Legacy crews were

[81] Shafter, op. cit.

completing site recordation. On June 1, 2009, Pacific Legacy received a letter from the Federated Indians of Graton Rancheria indicating they would be contacting Pacific Legacy regarding a site visit.

A letter was also sent to the Marin County Historical Society notifying the organization of the project and requesting any pertinent information they might have on historical resources within the area. To date, no response has been received from the Marin County Historical Society.

Dewey Livingston, a local historian and employee of the National Parks Service, was also contacted by Pacific Legacy at the suggestion of Synthesis Planning. Mr. Livingston responded by telephone on November 13, 2007, to express his interest in the project and his willingness to provide information that he had collected during his 25 years experience documenting local history. A formal telephone interview was conducted with Mr. Livingston by Pacific Legacy on November 19, 2007, in which further historic information was provided on several of the resources encountered during the archaeological survey.

Paleontological Resources. A fossil locality search was conducted at LSA's request on October 5, 2009, by Dr. Pat Holroyd of the University of California Museum of Paleontology (UCMP), Berkeley. The fossil locality search indicated that no fossil localities have been recorded in or adjacent to the project area. A search of the Berkeley Natural History Museum database also found that there are no recorded fossil localities within or adjacent to the project area (Berkeley Natural History Museum 2009).

Deposits within the project area consist of the following geological units, described in stratigraphic sequence from youngest (top) to oldest (bottom):

- *Holocene Soils.* The project area is underlain by the moderately-developed Quaternary (1,800,000 years B.P. to present) Holocene (10,000 years B.P. to present) Dipsea-Barnabe very gravelly loam (50-75% slopes) complex and the Cronkhite-Barnabe (15-30% slopes) complex, which are weathered from underlying metamorphic rock. These soil complexes likely contain vertebrate and invertebrate remains of extant, modern taxa that are not considered paleontologically significant. These soils are as much as 4 feet thick.[82]
- *Cretaceous Franciscan Volcanic and Meta-Volcanic Rock.* Underlying the Holocene soils on the eastern side of Sir Francis Drake Road is the Mesozoic (248,000,000 to 65,000,000 years B.P.) Cretaceous (144,000,000 to 65,000,000 years B.P.) Franciscan Formation of volcanic and meta-volcanic rock.[83] This formation is not fossiliferous.
- *Mesozoic Franciscan Mélange.* Underlying the Holocene soils on the western side of Sir Francis Drake Road is the Mesozoic (248,000,000 to 65,000,000 years B.P.) Franciscan Formation of volcanic and metamorphic rock.[84] This formation is not fossiliferous.

[82] Helley, E.J, K.R. La Joie, W.E. Spangle, and M.L. Blair, 1979. Flatland Deposits of the San Francisco Bay Region - their geology and engineering properties, and their importance to comprehensive planning. Geological Survey Professional Paper 943. U.S. Geological Survey and Department of Housing and Urban Development, Washington, D.C.
[83] Koenig, J.B., 1963. Geologic map of California : Santa Rosa sheet: California Division of Mines and Geology, scale 1:250000.
[84] Ibid.

4.4.2 Regulatory Framework

The California Public Resources and Health and Safety codes, the Marin Countywide Plan and CEQA comprise the legislative framework pertinent to cultural and paleontological resources in the project area. Because an ACOE permit will also be needed, a description is provided of Section 106 of the National Historic Preservation Act of 1966.

California Environmental Quality Act. CEQA applies to all discretionary projects undertaken or subject to approval by the state's public agencies (California Code of Regulations [CCR] Title 14(3) §15002(i)). CEQA states that it is the policy of the State of California to "take all action necessary to provide the people of this state with… historic environmental qualities… and preserve for future generations examples of the major periods of California history" (Public Resources Code [PRC] §21001(b), (c)). Under the provisions of CEQA, "A project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment" (CCR Title 14(3) §15064.5(b)).

CEQA requires that historical resources and unique archaeological resources be taken into consideration during the CEQA planning process (CCR Title 14(3) §15064.5; PRC §21083.2). If feasible, adverse effects to the significance of historical resources must be avoided or the effects mitigated (CCR Title 14(3) §15064.5(b)(4)). CEQA requires that all feasible mitigation be undertaken even if it does not mitigate impacts to a less than significant level (California Office of Historic Preservation 2001b:6; see also CCR Title 14(3) §15126.5 (a)(1)).

The term CEQA uses for significant cultural resources is "historical resource," which is defined as any resource that meets one or more of the following criteria:

- Listed in, or eligible for listing in the California Register of Historical Resources;
- Listed in a local register of historical resources (as defined at PRC §5020.1(k));
- Identified as significant in a historical resource survey meeting the requirements of PRC §5024.1(g); or
- Determined to be a historical resource by a project's lead agency (CCR Title 14(3) §15064.5(a)).

A historical resource consists of "Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California."

Generally, a resource is considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of Historical Resources" (CCR Title 14(3) § 15064.5(a)(3)). Archaeological resources may also be considered historical resources. For a cultural resource to qualify for listing in the California Register it must be significant under one or more of the following criteria:

- *Criterion 1:* Associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- *Criterion 2:* Associated with the lives of persons important in our past;

- *Criterion 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; or
- *Criterion 4:* Has yielded, or may be likely to yield, information important in prehistory or history.

In addition to being significant under one or more of these criteria, a resource must retain enough of its historic character and appearance to be recognizable as an historical resource and be able to convey the reasons for its significance (CCR Title 14 Section 4852(c)). Generally, a cultural resource must be 50 years or older to be eligible for the California Register**.**

Marin Countywide Plan. The Marin Countywide Plan promotes the identification and preservation of Marin County's historical and archaeological resources. Specifically, implementing programs HAR-1.1 through HAR-1.5 encourage the identification and documentation of archaeological and historical resources, promote avoidance of impacts to resources, encourage community involvement in preservation efforts, and encourage the regulation of modifications to historical structures and neighborhoods.

Public Resources Code §5097.5. California Public Resources Code §5097.5 prohibits excavation or removal of any "vertebrate paleontological site…or any other archaeological, paleontological or historical feature, situated on public lands, except with express permission of the public agency having jurisdiction over such lands." Public lands are defined to include lands owned by or under the jurisdiction of the state or any city, county, district, authority or public corporation, or any agency thereof. Section 5097.5 states that any unauthorized disturbance or removal of archaeological, historical, or paleontological materials or sites located on public lands is a misdemeanor.

Human Remains. Section 7050.5 of the California Health and Safety Code states that in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the remains are discovered has determined whether or not the remains are subject to the coroner's authority. If the human remains are of Native American origin, the coroner must notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission will identify a Native American Most Likely Descendant to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods.

Section 106 of the National Historic Preservation Act. If a project is subject to federal jurisdiction and the project is an undertaking as defined at 36 CFR §800.16(y) with the potential to cause effects on historic properties (36CFR §800.3(a)), Section 106 of the National Historic Preservation Act of 1966, as amended, must be addressed to take into account the effect of the undertaking on any district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (National Register).

An historic property is any district, site, building, structure, or object listed in or eligible for listing in the National Register at the local, state, or national level (36 CFR §800.16(l)(1). The criteria for determining a resource's eligibility for National Register listing are defined at 36 CFR §60.4. The four evaluation criteria are applied to the property in which the property's significance for its

association with important events or persons, importance in design or construction, or information potential is assessed. The criteria are as follows:

> . . .the quality of significance in American history, architecture, archaeology, 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
>
> A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> B. That are associated with the lives of persons significant in our past; or
>
> C. That 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. That have yielded, or may be likely to yield, information important in prehistory or history.

In order to be eligible for the National Register, a cultural resource must retain historical integrity, which is the ability of a resource to convey its significance. The evaluation of integrity must be grounded in an understanding of a resource's physical features and its environment, and how these relate to its significance. A property conveys its significance through the retention of its aspects of integrity. Under Criteria A, B, and C, the National Register places an emphasis on a resource appearing like it did during its period of significance to convey historical significance; under Criterion D, properties convey significance through the information they contain. Resources that meet the age guidelines, are significant, and possess integrity will generally be considered eligible for listing in the National Register.

4.4.3 Significance Criteria

Project implementation may have a significant impact if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5.
- Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to CEQA Guidelines Section 15064.5.
- Directly or indirectly destroy a unique paleontological resources or site or unique geologic feature.
- Disturb any human remains, including those interred outside of formal cemeteries.

The *CEQA Guidelines* defines a substantial adverse change as:

- Physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.
- Demolition or material alteration in an adverse manner of those physical characteristics of an historical resource which convey its historical significance and justify its inclusion in or

eligibility for inclusion in the California Register of Historical Resources, inclusion in a local register, or identification in a historical resources survey.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant impact on cultural resources if it would:

- Affect federally or State-listed resources.
- Disrupt or adversely affect a prehistoric or archaeological site, or a property of historic or cultural significance to a community or ethnic or social group, or a paleontological site, except as part of a scientific study.
- Affect a local landmark of local cultural/historical importance.

4.4.4 Impacts and Mitigation Measures

This following discussion analyzes impacts to cultural and paleontological resources that may result from project implementation. Mitigation measures are presented, where appropriate, to avoid, minimize, or offset potentially significant impacts.

The project has the potential to impact archaeological and architectural cultural resources, paleontological resources, and human remains. The potential impact to archaeological cultural resources could occur as a result of the disturbance of intact archaeological deposits that qualify as historical or archaeological resources under CEQA (Public Resources Code [PRC] Sections 21084.1 and 21083.2, respectively). The potential impact to architectural cultural resources could occur as a result of the replacement of structural features of the Sir Francis Drake roadway and corridor, as well as the alteration of the natural and engineered setting of the road corridor. The disturbance of human remains, associated grave goods, and paleontological resources could exceed the significance threshold established for these impacts.

The project proposes three classes of improvements that have the potential to impact the integrity of archaeological deposits. These classes are: (1) retaining wall improvements and slope repair; (2) vehicle pullouts; and (3) drainage feature replacement. Each class requirements some degree of excavation to accommodate a new design or engineering feature, and some of this excavation will occur in areas that have not been extensively disturbed in the past. These relatively undisturbed areas have a higher likelihood of containing intact archaeological deposits; the highest likelihood of encountering such deposits is in the vicinity of previously recorded archaeological sites.

The following recorded cultural resources were identified within or adjacent to the project right-of-way:

- *CA-MRN-479/P-21-000431* - This resource is a prehistoric archaeological site that consists of flaked stone tools and manufacturing debris.
- *CA-MRN-480/P-21-000432* - This resource is a prehistoric archaeological site that consists of flaked stone tools and manufacturing debris.

- *CA-MRN-546H/P-21-000477* - This resource consists of historical archaeological materials that may be associated with the historical Irving Fur Tannery.
- *CA-MRN-547H/P-21-000478* - This resource is a historical concrete railroad bridge bulkhead.
- *CA-MRN-548H/P-21-000479* - This resource consists of the archaeological remains of a railroad bridge.
- *CA-MRN-550H/P-21-000481* - This resource consists of a historical railroad grade.
- *CA-MRN-551H/P-21-000482* - This resource consists of discontinuous segments of a historical road complex.
- *P-21-002538* - This resource consists of several historical creek improvements associated with the Villa Botini Resort.
- *PL-SFD-02* - This resource consists of a refuse scatter of historical debris.
- *PL-SFD-15* - This resource consists of a house lot with structural footings, a foundation, and landscaping remains.

Although the resources listed above are within or adjacent to the project right-of-way, some have a lower potential for impact due to the nature of their construction or their distance from proposed activities. Project plans and baseline cultural resources information are not sufficient to pinpoint the location of potential impacts. However, sufficient detail exists to support the conclusion that the following resources would not be directly impacted by the project due to their distance from proposed activities, or due to modern reuse and alterations: CA-MRN-550H/P-21-000481 (railroad grade); CA-MRN-551H/P-21-000482 (road complex); and P-21-002538 (creek improvements).

The other resources in the bulleted list above are subject to impact by proposed project activities. The potential for these resources to qualify as historical or archaeological resources under CEQA has not been determined. For this reason, this analysis assumes that these resources have that potential, and, in some cases, do so qualify. Therefore, should these resources be damaged or disturbed by the proposed project, their ability to convey their significance could be impaired, resulting in an impact under CEQA. This impact would be considered significant.

Two impact scenarios are discussed for each potential impact. The first consists of only the proposed project as described in *Sir Francis Drake Boulevard Rehabilitation Project*.[85] The second consists of Option A, which involves the removal of redwood trees to facilitate roadway improvements.

Impact CULT-1: Project implementation may cause an adverse change to a historical resource or unique archaeological resource, including federally or State-listed resources, pursuant to CEQA. (S)

The construction of the proposed project includes ground disturbing activities that could affect prehistoric and historical archaeological deposits. Such disturbance constitutes a significant impact when it materially impairs the ability of the deposits to convey their importance and justify their historical significance. If this ability to convey significance, also called "integrity," is compromised, then the deposit loses the potential to impart information important in history or prehistory.

[85] County of Marin Department of Public Works and the Transportation Authority of Marin, October 17, 2008.

Mitigation Measure CULT-1a: Prior to project construction, a professional archaeologist shall establish a barrier around recorded cultural resources subject to impact by project activities so that these Environmentally Sensitive Areas (ESAs) can be avoided during construction. The professional archaeologist shall use high visibility temporary construction fencing or a similar durable material (i.e., not construction flagging) to establish the ESAs. For resources in the project area (i.e., the County right-of-way consisting of 30 feet on each side of the roadway centerline), the fencing shall delineate the entire boundary of the resource. For resources partially in or adjacent to the project area, the fencing shall delineate those portions of the resource that extend into, or are adjacent to, the project area.

To the greatest extent feasible, no project construction or access by construction crew shall occur in these areas. The project superintendent, crew foreman, environmental compliance officer, or other responsible project official shall review the condition of the fencing and check for unauthorized entry into these areas on a weekly basis. Any deficiencies in the fencing shall be repaired at the direction of the responsible project official.

Mitigation Measure CULT-1b: If project construction must occur within ESAs (or if Option A requires tree root mass removal in an ESA, see below), a qualified professional archaeologist shall monitor the ground-disturbing component of such construction. The purpose of the monitoring is to identify intact archaeological deposits prior to substantial disturbance by project construction activity. If intact archaeological deposits are identified by archaeological monitoring, the monitor shall be empowered to temporarily halt construction to assess the find. Impacts to the find by project activities shall be avoided. If such avoidance is not feasible, the County shall conduct the necessary study, in consultation with the project archaeologist, to determine if the deposit qualifies as a historical or unique archaeological resource under CEQA. If the deposit *does not* so qualify, project construction may resume with the continuation of archaeological monitoring. If the deposit *does* so qualify, then the County shall develop and implement, in consultation with the project archaeologist, a plan to mitigate the impact.

Mitigation may consist of, but is not limited to, systematic recovery and analysis of archaeological deposits; recording the resource; preparation of a report of findings; and accessioning recovered archaeological materials at an appropriate curation facility. Public educational outreach may also be appropriate. If data recovery excavation is the means selected to recover the scientifically consequential information contained in the deposit, a data recovery plan must be prepared, consistent with the requirements of *CEQA Guidelines* Section 15126.4(b)(3)(C). If the deposit is prehistoric in nature, the County shall seek and consider the input of the Federated Indians of Graton Rancheria regarding the proposed treatment prior to implementing the plan. Any reports generated from the evaluation or mitigation shall be submitted to the County and the Northwest Information Center.

Mitigation Measure CULT-1c: If deposits of prehistoric or historical archaeological materials are encountered during project activities that are not archaeologically monitored, all work within 25 feet of the discovery shall be redirected and a qualified archaeologist contacted to assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. The County shall also be notified. Project personnel shall not

collect or move any archaeological materials. Adverse effects to the deposits shall be avoided by project activities or, if the deposits cannot be avoided, they shall be evaluated as described in Mitigation Measure CULT-1b to determine if the deposit qualifies as a historical or archaeological resource under CEQA and handled, documented and treated accordingly.

The County shall inform its contractor(s) of the archaeological sensitivity of the project area by including the following directive in contract documents:

If prehistoric or historical archaeological deposits are discovered during project activities, all work within 25 feet of the discovery shall be redirected and a qualified archaeologist contacted to assess the situation, consult with agencies as appropriate and make recommendations regarding the treatment of the discovery. Project personnel shall not collect or move any archaeological materials or human remains and associated materials. Prehistoric materials can include flaked-stone tools (e.g., projectile points, knives, choppers) or obsidian, chert, basalt, or quartzite toolmaking debris; bone tools; culturally darkened soil (i.e., midden soil often containing heat-affected rock, ash and charcoal, shellfish remains, faunal bones, and cultural materials); and stone milling equipment (e.g., mortars, pestles, handstones). Prehistoric sites often contain human remains. Historical materials can include wood, stone, concrete footings, walls, and other structural remains; and deposits of wood, glass, ceramics, metal, and other refuse. If the archaeological deposits are prehistoric in nature, the archaeologist shall consult with the Federated Indians of Graton Rancheria regarding the treatment of the find, and the feasible recommendations of the Tribe shall be incorporated in the approved plan.

Significance After Implementation. Implementation of Mitigation Measures CULT-1a through CULT-1c would reduce this potential impact to a ***less-than-significant level***. This would be accomplished through the avoidance of impacts to archaeological deposits; the evaluation of archaeological deposits that could not be avoided or that are discovered during construction; and the recovery of scientifically consequential information that would be lost to project construction, including a process by which input is sought from descendant communities.

Option A. The implementation of Option A includes ground disturbing activities that could affect prehistoric and historical archaeological deposits. The removal of redwood trees as called for under Option A would require the removal of a substantial root mass for most, if not all, trees. The removal of such root masses has the potential to disturb both recorded archaeological deposits and archaeological deposits that have not yet been discovered. Such disturbance constitutes a significant impact when it materially impairs the ability of the deposits to convey their importance and justify their historical significance. If this integrity is compromised, then the deposit loses the potential to impart information important in history or prehistory. The implementation of Option A could result in impacts that exceed those that could occur with the implementation of only the proposed project. The following mitigation measure would reduce the impact to less than significant.

Mitigation Measure CULT-1d: If feasible, trees shall be removed by grinding each stump to grade and using a chemical application to kill stump growth. If this approach is taken, impacts to archaeological deposits due to Option A would be less than significant. If this approach is not feasible, and if the root mass must be removed, then Mitigation Measures

CULT-1b or -1c shall be implemented, as appropriate, depending on whether or not the tree is located within an ESA.

Significance After Implementation. Implementation of Mitigation Measure CULT-1d would reduce the Option A impact to historical and archaeological resources to a ***less-than-significant*** level.

Impact CULT-2: Project implementation may cause an adverse change to a unique potential historical resource, including federally or State-listed resources and local landmarks (Sir Francis Drake Boulevard), pursuant to CEQA. (S)

The proposed project would alter some of the engineering features, physical design characteristics, and natural setting of SFDB. SFDB is a modern paved roadway that follows the route of historical pack trails that brought many of the original non-native Euro-American inhabitants to the area. First graded in 1926 to 1927, the route was improved with a poured concrete roadway in 1929, and is associated with a complex of other historical roads in the area. SFDB has remained relatively unchanged from its modern form since its opening in 1929, and would likely be considered a historical resource under CEQA for its association with the history of the interior of Marin County, and as an important county arterial linking many smaller, rural communities. The road may be considered a historic district for its linkage of associated design and engineering features that comprise a distinguishable historical entity. For the purposes of this analysis, and because a definitive eligibility evaluation of the segment of the road in the project area has not been done, it is assumed that SFDB would be considered historically significant for its association with the development of the interior of Marin County.

Pacific Legacy conducted an archaeological survey of the entire project area in 2007 (updated in 2009). During the survey, the segment of SFDB in the project area was recorded as a cultural resource.[86] The survey identified and recorded 75 road features associated with SFDB. These 75 features consist of a parallel drainage ditch, 68 culverts, four erosion control walls, one retaining wall, and the Irving Bridge. Pacific Legacy recorded the location of each feature, provided a basic description, and photographed each feature.

The project proposes three classes of improvements that have the potential to impact the engineering features, design characteristics, and natural setting of SFDB. These classes are: (1) pavement rehabilitation; (2) alignment adjustments, retaining wall improvements, and slope repair; (3) vehicle pullouts; and (4) drainage feature replacement. Each class requires some degree of alteration of existing roadway or roadway features to accommodate a new design or construction feature. These alterations would change the physical characteristics and form of SFDB that contribute to its historical status. Each class of alterations and the potential for impacts from these changes are discussed below.

Pavement Rehabilitation. The project proposes to repair and rehabilitate the surface of the SFDB roadway. This would include, in some segments, the structural cracking and compacting of the existing concrete slab roadway to stabilize the surface for new rubberized asphalt concrete. This process would alter portions of the original poured-concrete roadway from 1929.

[86] *Archaeological Survey Report for the Sir Francis Drake Boulevard Improvements Project, Marin County, California.* Pacific Legacy, Berkeley, California, September 2009.

Pacific Legacy noted that the integrity of the roadway surface is fair to poor in the project area, and many segments of roadway exhibit "shattered slab," which are structural failures that have been repaired with the addition of asphalt concrete over time. The project would replace the remaining portions of original concrete roadway, which are cracked and deteriorating, resulting in an alteration to the roadway's integrity of materials and design. However, these aspects of integrity for SFDB are already diminished due to the roadway surface's deterioration. In addition, the replacement materials would serve a similar purpose: to maintain a durable roadway surface for motorized vehicles. Because of the roadway's diminished integrity, and the similar structural use and purpose of the replacement materials, the roadway rehabilitation would result in a less-than-significant impact to SFDB.

Alignment Adjustments, Retaining Wall Improvements, and Slope Repair. The project proposes to make adjustments to portions of the SFDB alignment to conform to Caltrans design and safety guidelines and AASHTO. The adjustments would consist of alterations to portions of the roadway's horizontal alignment and width, which would change portions of the alignment from the original route in 1929.

Alignment Adjustments. The project would make adjustments to the roadway's alignment and width in places, resulting in an alternation to the roadway's integrity of design, workmanship, and materials. However, the alternations would be localized and would take place within the same corridor used historically for the road; a new corridor or abrupt changes to the grade, direction, or aspect of the road are not proposed. Additionally, the materials and workmanship used to prepare the replacement surfaces would not substantially differ from the original construction techniques such that the finished roadway would be visually discordant. The alterations are slight adjustments and would not diminish the purposeful design or aesthetic characteristics of the roadway. For these reasons, the roadway alignment adjustments would result in a less-than-significant impact to SFDB.

Retaining Wall Improvements and Slope Repair. The project proposes to construct segments of retaining wall on portions of the SFDB alignment to facilitate alignment adjustments and to repair a localized slope failure. The retaining walls segments would be used to increase the shoulder width of the roadway without extending the grading limits. The walls would be constructed with tinted, textured concrete that has the appearance of wood. Use of this tinted concrete would create a less visually intrusive slope retention structure that will blend in more effectively with the background of natural vegetation and soil. The localized slope repair would occur in the vicinity of Shafter Bridge, and would consist of the construction of a cantilevered tie-back concrete retaining wall and associated energy dissipation structure for runoff. The retaining walls and slope repair would introduce modern structure and erosion control features that do not date to the original period of SFDB, resulting in an alternation to the roadway's integrity of design, workmanship, and materials. However, the slope repair would restore the roadway to substantially the same appearance as before, with the exception of the visible new retaining wall. In addition, retaining walls are already in use on portions of SFDB in the project area, and the installation of new retaining walls would be consistent with the historical need for slope retention and roadway engineering that guided the original construction in 1929. The retaining walls and slope repair are alterations that would not substantially diminish the purposeful design or aesthetic characteristics of the roadway.

Vehicle Pullouts. The project proposes to improve some areas currently used as pullouts to allow slower vehicles to temporarily leave the roadway and allow traffic to pass. The improvements to the pullouts would consist of localized widening to prepare a surface to be covered in porous pavement.

Other existing roadside spaces used as ad hoc pullouts are hazardous due to insufficient sight distance, and use of these areas as pullouts would be terminated by the placement of boulders and other natural materials that would block vehicle access.

The project would improve some pullouts on SFDB, resulting in an alteration to the roadway's integrity of design, workmanship, and materials. However, the pullouts would be intermittent and placed at intervals at a considerable distance from one another, and would not be visible as an aggregate change to the linear alignment of the roadway. The termination of parking in the other existing ad hoc pullouts would have a beneficial impact on the historical qualities of SFDB, in that it would reduce the numbers of automobiles parked along what would otherwise be a winding, relatively undeveloped stretch of bucolic country road, improving the aesthetic experience for motorists. For these reasons, the construction of pullouts would result in a less-than-significant impact to SFDB.

Drainage Feature Replacement. The project proposes to replace all existing metal or plastic culverts in the project area, and install a sub-drain at locations where the roadway slopes to existing bank and creates a drainage problem. The culvert replacement would remove the existing culvert and reinstall a new culvert pipe in approximately the same alignment and grade as the original. New concrete headwalls would be installed at the inlet and outlet of each culvert pipe replacement. The sub-drain installation would use a perforated pipe to convey collected water to the nearest culvert. Energy dissipation structures, which would not be visible from the roadway, would be provided as needed. The culvert replacement would replace some of what appear to be original drainage features of SFDB.

As previously noted, Pacific Legacy recorded the segment of SFDB in the project area, including 72 associated drainage, roadway, or erosion control features. Each culvert and headwall was photographed, its general characteristics described, and its location mapped. Of the 65 culvert headwalls recorded, 20 percent are either missing or noted as non-original. The replacement headwalls would be of comparable materials, and would serve a similar purpose: to stabilize the culvert structure and maintain proper roadway drainage. Many of the culvert headwalls would be constructed in locations that do not currently have headwalls, or would replace headwalls that were replacements themselves.

Therefore, the culvert headwalls in the project area do not reflect an intact collection of drainage-related features, but rather represent an array of ancillary roadway features that are replaced as needed due to periodic damage, weathering, and deterioration. As such, they are considered to have a service life, beyond which, as a result of damage or otherwise, they are replaced with modern materials. They do not display a continuity of integrity of design, materials, or workmanship. In addition, the culverts' association with SFDB as design and engineering features has been adequately recorded by Pacific Legacy as part of its archaeological survey. The headwalls are the component of the culvert replacement that is most visible from the roadway, and their form, design characteristics, and locations have been documented as historical qualities that contribute to the significance of SFDB. Therefore, the impact of the loss of the historic headwalls is potentially significant.

> Mitigation Measure CULT-2a: The loss of historic headwalls can be mitigated by the documentation that will preserve a record of their contribution to the original roadway design.

Mitigation Measure CULT-2b: The Marin County DPW shall distribute the Pacific Legacy archaeological survey report to the Marin History Museum Library. Information concerning the location of prehistoric archaeological deposits (including maps and written descriptions) shall be removed from these distribution copies. The distribution of the documentation of SFDB and its associated features will serve an interpretive function at the Museum Library by making publicly available information about the historical development of Marin County's historical roads, and the landscape features that once contributed to this history. Marin County DPW shall retain the documentation to provide a record of historical engineering features for future planning efforts.

Significance After Implementation. Implementation of Mitigation Measures CULT-2a through CULT-2c would reduce the impact of proposed roadway improvements on the historic features of the portion of SFDB in the project area to a ***less-than-significant*** level.

Option A. The implementation of Option A includes ground disturbing activities for the removal of redwood trees to provide additional shoulder area, a more uniform width, and increased sight distance as part of the alignment adjustment of SFDB. The removal of the redwood trees would not significantly alter the appearance of portions of the SFDB roadway corridor. The corridor retains its integrity of feeling and setting with respect to the backdrop of rugged hillsides, drainages, and natural vegetation, and this is a defining visual attribute experienced by motorists traveling on SFDB.

Although the removal of the redwood trees would alter the integrity of setting of SFDB, the balance of the other aspects of historical integrity would remain. The diminishment of the integrity of setting, though it would occur, would be relatively small, and would not be sufficient to irreparably diminish the ability of SFDB to convey the historical qualities that justify its significance. SFDB would remain a two-lane, rural roadway that contours along the slopes adjacent to Lagunitas Creek, and its appearance would be recognizable to a person traveling the same route during the road's period of historic significance. For these reasons, implementation of Option A would result in a less than significant impact on the historic character of the roadway.

Impact CULT-3: Project implementation may destroy paleontological resources or sites.

The construction of the proposed project includes the type of ground disturbing activities that could result in the destruction of paleontological resources. However, the geologic formations that underlie the project area are not known to be fossiliferous, and the soils directly beneath the project area are not known to contain paleontologically significant fossils. Despite this, there is a possibility that fossils could be encountered, and if such fossils qualified as paleontologically significant, a significant impact would occur. The following mitigation measure is recommended.

Mitigation Measure CULT-3: The County shall inform its contractor(s) of the paleontological sensitivity of the project area by including the following directive in contract documents:

The subsurface of the construction site may be sensitive for paleontological resources. If paleontological resources are encountered during project subsurface construction, all ground-disturbing activities within 25 feet shall be redirected and a qualified paleontologist contacted to assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. Project personnel shall

not collect or move any paleontological materials. Paleontological resources include fossil plants and animals, and evidence of past life such as trace fossils and tracks. Ancient marine sediments may contain invertebrate fossils such as snails, clam and oyster shells, sponges, and protozoa; and vertebrate fossils such as fish, whale, and sea lion bones. Vertebrate land mammals may include bones of mammoth, camel, saber tooth cat, horse, and bison. Paleontological resources also include plant imprints, petrified wood, and animal tracks.

Adverse effects to such paleontological resources shall be avoided. If avoidance is not possible, the discovery should be assessed to determine its paleontological significance. If the discovery is not significant, avoidance is not necessary. If the paleontological resources are significant, they will need to be avoided or adverse effects must be mitigated. Upon completion of the assessment, the paleontologist should prepare a report documenting the methods and results, and provide recommendations for the treatment of the paleontological resources discovered. The report should be submitted to the County and the University of California, Museum of Paleontology.

Significance After Implementation. The implementation of Mitigation Measure CULT-3 would reduce this potential impact to paleontological resources to a ***less-than-significant*** level through the avoidance of impacts to paleontological resources; the evaluation of paleontological resources that could not be avoided; and the recovery of scientifically consequential information that would be lost to project construction.

Impact CULT-4: The construction of the proposed project may disturb human remains.

The construction of the proposed project includes ground disturbing activities that could result in the disturbance of human remains. Such disturbance constitutes a significant impact when human remains and associated grave goods are uncovered, excavated, or otherwise encounter an activity that is not related to their natural state.

The project proposes three classes of improvements that have the potential to disturb human remains. These classes are: (1) retaining wall improvements and slope repair; (2) vehicle pullouts; and (3) drainage feature replacement. Each class requirements some degree of excavation to accommodate a new design or construction feature, and some of this excavation would occur in areas that have not be extensively disturbed in the past. These relatively undisturbed areas have a higher likelihood of containing human remains, and the highest likelihood of encountering such remains occurs in the vicinity of previously recorded archaeological sites. Should human remains be disturbed by the proposed project the impact would be considered significant.

The following mitigation measure is recommended, which requires notification and treatment procedures for human remains pursuant to California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98.

Mitigation Measure CULT-4: If human remains are encountered during construction activities, these remains shall be treated in accordance with Health and Safety Code §7050.5. The County shall inform its contractor(s) of the sensitivity of the project area for human remains by including the following directive in contract documents:

If human remains are encountered during project activities, whether archaeologically monitored or not, work within 25 feet of the discovery shall be redirected and the Marin County Coroner notified immediately. At the same time, a professional archaeologist shall be contacted to assess the situation and consult with agencies as appropriate. The County should also be notified. Project personnel shall not collect or move any human remains and associated materials. If the human remains are of Native American origin, the Coroner must notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission will identify a Most Likely Descendant (MLD) to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods.

Upon completion of the assessment, the archaeologist shall prepare a report documenting the methods and results, and provide recommendations for the treatment of the human remains and any associated cultural materials, as appropriate and in coordination with the recommendations of the MLD. The report shall be submitted to the County and the Northwest Information Center.

Significance After Implementation. The implementation of Mitigation Measure CULT-4 would reduce this potential impact to a ***less-than-significant*** level through compliance with the statutory requirements of the California Health and Safety Code and Public Resources Code, as well as the respectful treatment of human remains and grave goods in accordance with the recommendations of the descendant community.

4.5 GEOLOGY AND SOILS

This section describes the geologic environment of the project area and assesses potential impacts from seismically-induced fault rupture, strong ground shaking, liquefaction, slope failure, lateral slope deformation, differential settlement and unstable or expansive soils. A site-specific geotechnical investigation for the Sir Francis Drake Boulevard Rehabilitation[87] (Geotechnical Investigation) explored and evaluated geologic and geotechnical soil conditions of the project area, including a field investigation and soil borings, in order to provide geotechnical conclusions and recommendations for the design of the pavement rehabilitation and stabilization. Information from the Geotechnical Investigation was considered in developing the site-specific setting, impact analysis and mitigation measures. Mitigation measures for the identified significant impacts are provided, as appropriate.

4.5.1 Setting

The following description of setting is based on published and unpublished geologic reports and maps from the United States Geological Survey (USGS), the California Geological Survey (CGS), Association of Bay Area Governments (ABAG), the County of Marin, the site-specific geotechnical investigation, and other sources.

Geology and Soils. The project is located within the Coast Ranges Geomorphic Province, a relatively geologically young and seismically-active region on the western margin of the North American plate.[88] The Province is characterized by northwest trending faults, mountain ranges, and valleys which mimic the prevailing structural trends of the underlying bedrock. In general, the Coast Ranges are composed of sedimentary bedrock with layers of recent alluvium filling the intervening valleys.[89] Regional mapping indicates that the bedrock of the northern portion of the project area as Franciscan Complex mélange and the southern portion as Franciscan Complex coherent bedrock.[90] Franciscan Complex varies significantly in makeup and may include sandstone, shale, greenstone, graywacke, chert or conglomerate.[91] The Geotechnical Investigation indicates that in addition to the presence of mélange and greenstone bedrock (as indicated by regional mapping described above), the northernmost portion of the project area is underlain by coherent shale and sandstone, and that surficial deposits along the road alignment include colluvium,[92] landslide deposits, and alluvium overlying the bedrock.[93]

The United States Natural Resources Conservation Service (NRCS) provides a database of historical soil classification and mapping information. The soils of the project area are mapped primarily as cronkhite- or dipsea-barnabe complex clay or gravelly loams, and fluvial deposits along the channel of Lagunitas Creek. The NRCS provided ratings of the soils of the area as generally low for shrink-swell potential, moderately erodible by water, having moderate to low corrosiveness to concrete, and

[87] Kleinfelder, Inc., 2008. Geotechnical Investigation Sir Francis Drake Boulevard Pavement Rehabilitation, Marin County, California. Job No: 82400 (SRO8R038), 21 August.
[88] California Geographic Survey (CGS), 2002. California Geomorphic Provinces, Note 36.
[89] Sloan, Doris, 2006. Geology of the San Francisco Bay Region, University of California Press.
[90] Wagner, D.L, Bortugno, E.J., 1982. Geologic Map of the Santa Rosa Quadrangle, California.
[91] Sloan, 2006. op. cit.
[92] Colluvium consist of soil and organic debris that accumulate via gravity at the base of a slope and generally includes unsorted angular rock fragments.
[93] Kleinfelder, 2008. op. cit.

as moderate to highly corrosive to steel.[94] In addition, The NRCS includes AASHTO suitability ratings for soils in the database, with soils rated as A-1 to A-3 to be 'excellent to good' and those rated as A-4 to A-6 as being 'fair to poor' as sub-grade for roadbeds. The dipsea-barnabe gravelly loams are rated as A-2, with the other soil types rated A-4 or A-6. Fluvial deposits are not rated by AASHTO. The Geotechnical Investigation notes that for the 11 borings conducted for the investigation (all located within the area of the road bed), that shallow subsurface materials generally consisted of fill, dense gravelly clay, gravely clay with sand, colluvium, or weathered greenstone bedrock. The borings ranged from 5.4 to 11.5 feet in depth.[95]

The project area is a 5.2 mile long road alignment within a (generally) 60-foot right-of-way.[96] The project area roughly parallels a meandering portion of Lagunitas Creek, and includes one crossing of Lagunitas Creek and several crossings of ephemeral or perennial tributaries.[97,98] The elevation at the southeast end of the project area at Shafter Bridge is approximately 185 feet National Geodetic Vertical Datum (NGVD)[99], and the road undulates gently down towards Platform Bridge Road, where the northwest boundary of the project area has an elevation of approximately 89 feet NGVD. The road surface is approximately 25 to 30 feet in width and, in places, is set into a bench cut from hillsides sloping up and away from the Lagunitas Creek channel.[100] The Lagunitas Creek channel and its tributaries form the dominant topographical features near the project area, while the surrounding area is generally rolling to very hilly, with the peak of Barnabe Mountain (1,466-feet NGVD) located about 4,000-feet northeast of the central project area. Additional information describing existing drainage patterns on and around the project area are provided in Section 4.6, Hydrology and Water Quality.

The project area has been mapped as outside of the boundary of areas subject to urbanization and outside the North San Francisco Bay Production Consumption boundary for aggregate sources; the area has not been mapped by the State of California as a source location for aggregate minerals of regional or local value to residents of the State or area.[101]

Seismic Conditions. The project area is within the San Andreas Fault Zone (SAFZ), a complex of active faults forming the boundary between the North American and Pacific lithospheric plates that extends about 800 miles from Punta Gorda on the northern California coast to the head of the Gulf of California in Mexico.[102] Movement of the plates relative to one another results in the accumulation of strain along the faults, and numerous moderate to strong historic earthquakes have been generated in northern California in the SAFZ.[103] This level of active seismicity results in a relatively high seismic risk in the San Francisco Bay Area. The SAFZ includes numerous faults found by the CGS under the

[94] NRCS, 2009. Web Soil Survey, websoilsurvey.nrcs.usda.gov. Accessed 10-1-09.
[95] Kleinfelder, 2008. op. cit.
[96] Stevens, Robert, 2009. Associate, BKF Engineering. Draft - Sir Francis Drake Boulevard Rehabilitation Project Description, 28 September.
[97] USGS, 1978. San Geronimo Quadrangle 7.5' Series Topographic Map.
[98] USGS, 1976. Inverness Quadrangle 7.5' Series Topographic Map.
[99] For most practical purposes, NGVD is the approximately the same as Mean Sea Level.
[100] BKF, 2009. Sir Francis Drake Boulevard Improvements (from Shafter Bridge to Platform Bridge Road) Plan Set (30% Construction Documents), 23 April.
[101] California Department of Conservation, 1986. Mineral Land Classification: Aggregate Materials in the San Francisco – Monterey Bay Area. Special Report 146, California Division of Mines and Geology.
[102] Schulz, Sandra S. and Wallace, Robert E., 1997. The San Andreas Fault. Website: pubs.usgs.gov/gip/earthq3/ Accessed 5 October 2009.
[103] Wallace, Dr. Robert E., Editor, 1991. Professional Paper 1515, "The San Andreas Fault System, California.," USGS.

Alquist-Priolo Earthquake Fault Zoning Act (A-PEFZA) to be "active" (i.e., to have evidence of fault rupture in the past 11,000 years). Some of the major active faults within the SAFZ include the San Andreas, Maacama, Hayward-Rodgers Creek, San Gregorio-Seal Cove, Concord - Green Valley, Greenville, and Calaveras faults. Regional active faults are shown on Figure 4.5-1.

In a report published in 2008, the USGS estimated that there was a 63 percent probability that between 2008 and 2038, a 6.7 or greater magnitude earthquake will occur in the San Francisco Bay Region. The probability of a 6.7 magnitude or greater earthquake occurring along individual faults was estimated to be 21 percent along the San Andreas Fault, 31 percent along the Hayward-Rodgers Creek Fault, and 7 percent along the Calaveras Fault. In addition, there is a cumulative 14 percent chance of a background (other earthquake source, either mapped or undiscovered) event occurring. When predictions are expanded to 100 years, it is estimated that about three M_W 6.7 or greater events could occur during that time. Thus the probability of at least one M_W 6.7 or greater earthquake rises to the near certainty of about 96 percent when calculated for a 100-year span.[104]

There are no A-PEFZA active or potentially active[105] faults mapped that intersect the project area.[106] The project area does not intersect an Alquist-Priolo Earthquake Fault Zone and the nearest A-PEFZA fault zone is located approximately 2 miles to the west along the San Andreas Fault. The next nearest active fault is the Hayward-Rodger Creek fault 20 miles to the east. Both the San Andreas and Hayward-Rodgers Creek faults are right lateral strike-slip faults with a northwest-southeast axis,[107] and, as noted above, have a 21 percent and 31 percent chance respectively of an M_w6.7 earthquake occurring between 2008 and 2038.

Seismic and Geologic Hazards. This section describes hazards related to the seismic and geologic conditions of the project area and is partly based on the 2009 Geotechnical Investigation.

Surface Rupture. Surface rupture occurs when the ground surface is broken due to fault movement during an earthquake. The location of surface rupture generally can be assumed to be along an active or potentially active major fault trace. No active or potentially active faults are mapped to intersect the project area.

Ground Shaking. Ground shaking is a general term referring to all aspects of motion of the earth's surface resulting from an earthquake, which is normally the major cause of damage in seismic events. The extent of ground shaking is controlled by the magnitude and intensity of the earthquake, distance from the epicenter, and local geologic conditions. A related concept is acceleration, which is measured as a fraction or percentage of the acceleration gravity (g); it measures the acceleration of the ground as it moves during an earthquake. The Modified Mercalli Intensity Scale (MMI) is the

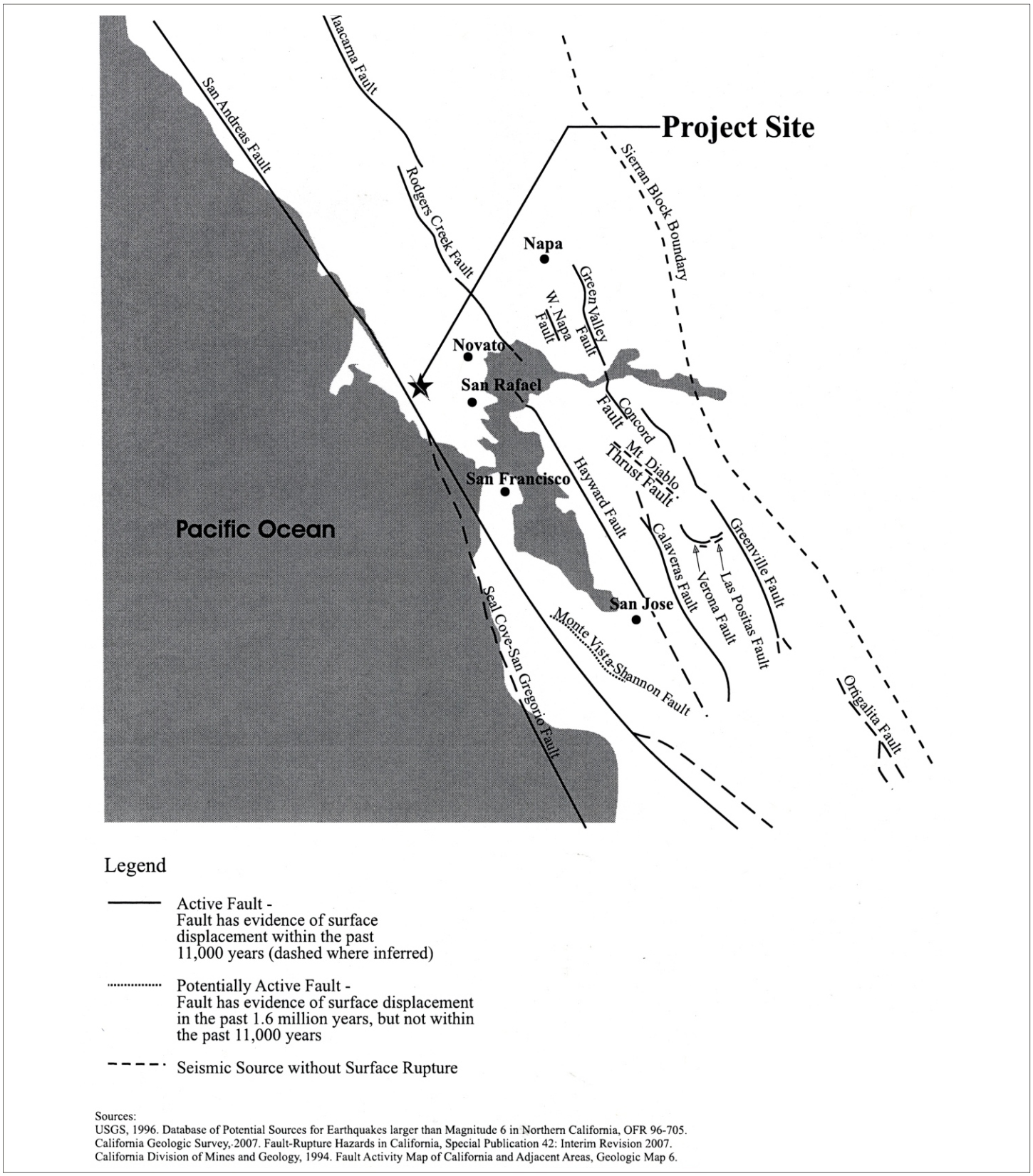
[104] 2007 Working Group on California Earthquake Probabilities, 2008, The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2): U.S. Geological Survey Open-File Report 2007-1437 and California Geological Survey Special Report 203 [http://pubs.usgs.gov/of/2007/1437/].
[105] Originally defined as those faults showing Quaternary displacement, since 1975 limited to those with a relatively high potential for ground rupture, sufficiently active (Holocene displacement somewhere on the fault), and well defined.
[106] Bryant, William A., Hart, Earl W., Interim Revision 2007. Special Publication 42: Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps. California Department of Conservation, California Geological Survey.
[107] Right-lateral: If the trace of the fault were viewed while standing on one side during an event, it would appear that the ground on the other side of the fault moved to the right. Strike-slip: The sides of a fault are moving laterally relative to each other with little or no vertical movement.

most commonly used scale for measurement of the subjective effects of earthquake intensity (Table 4.5.A). The closest active fault to the project area is the San Andreas Fault, located approximately two miles to the west. The ABAG earthquake hazard mapping is based on research by the USGS, and indicates a Magnitude 7.9 event on the San Andreas Fault (similar to the 1906 earthquake) would result in very strong to violent (MMI-VIII/IX) shaking in the project area.[108] Other potentially damaging seismic sources located in the vicinity of the project area include the active Hayward-Rodgers Creek faults, approximately 20 miles to the east, and considered capable of generating a moment magnitude (M_W) 7.0 earthquake.

Estimates of the peak ground acceleration have been made for the Bay Area based on probabilistic models that account for multiple seismic sources. Under these models, consideration of the probability of expected seismic events is incorporated into the determination of the level of ground shaking at a particular location. The CGS estimates the expected peak horizontal acceleration generated by any of the seismic sources potentially affecting the project area as 0.597.[109] This level of ground acceleration at the project area is a potentially significant hazard; and improvements would need to be constructed to withstand the expected acceleration of the ground. Further, there is a 10 percent chance this expected peak horizontal acceleration factor could be exceeded over the next 10 years.

Liquefaction and Lateral Spreading. Liquefaction is the temporary transformation of loose, saturated granular sediments from a solid state to a liquefied state as a result of seismic ground shaking. In the process, the soil undergoes transient loss of strength, which commonly causes ground displacement or ground failure to occur. This can result in either incremental or catastrophic structural failure. Liquefaction potential varies according to the thickness of the alluvial deposits, the distribution of clay-free granular materials within those deposits, and the abundance of groundwater shallower than 50 feet. Since saturated soils are a necessary condition for liquefaction, soil layers in areas where the groundwater table is near the surface have higher liquefaction potential than those in which the water table is located at greater depths.[110]

[108] ABAG, 2004. Earthquake Shaking Scenario, Entire San Andreas Fault: Magnitude 7.9 event. Accessed 10/5/09 at: www.abag.ca.gov.
[109] California Geological Survey (CGS), 2007 revised 2008, Probabilistic Seismic Hazards Mapping Ground Motion Page, accessed 10/05/2009, www.consrv.ca.gov/cgs/rghm/pshamap/pshamap.asp.
[110] Perkins, Jeanne B. 2001. The Real Dirt on Liquefaction, A Guide to the Liquefaction Hazard in Future Earthquakes Affecting the San Francisco Bay Area, ABAG Publication Number: P01001EQK, February.



Sources:
USGS, 1996. Database of Potential Sources for Earthquakes larger than Magnitude 6 in Northern California, OFR 96-705.
California Geologic Survey,-2007. Fault-Rupture Hazards in California, Special Publication 42: Interim Revision 2007.
California Division of Mines and Geology, 1994. Fault Activity Map of California and Adjacent Areas, Geologic Map 6.

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FIGURE 4.5-1

Sir Francis Drake Roadway Improvements Project

Regional Active Faults

Back of Figure 4.5-1

Table 4.5.A: Modified Mercalli Intensity Scale

I	Not felt except by a very few under especially favorable circumstances.
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck. Duration estimated.
IV	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
VII	Everybody runs outdoors. Damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.
XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Board fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted.

Source: California Geological Survey 2002. *How Earthquakes and Their Effects are Measured*: Note 32.

A band of soils and surface deposits along both sides of Lagunitas Creek, roughly corresponding to the soils mapped as fluvial deposits by the NRCS, are rated as being a moderate to high hazard for liquefaction by USGS/ABAG regional mapping.[111] A moderate to high hazard for liquefaction indicates that a combination of the three factors driving the liquefaction hazard (density and composition of near surface soils, presence and level of groundwater, and potential earthquake shaking intensity) combine to present a likelihood that, in the event of a earthquake on an appropriate fault, the area would be exposed to strong enough shaking for some damaging liquefaction to occur. Lateral spreading is a form of horizontal displacement of soil toward an open creek channel or other "free" face, such as an excavation boundary. Lateral spreading can result from either the slump of low- cohesion unconsolidated material or more commonly by liquefaction of either the soil layer or a subsurface layer underlying soil material on a slope.[112] The lateral spreading hazard tends to mirror the liquefaction hazard for a site.

Expansive Soils. Expansion and contraction of volume can occur when expansive soils undergo alternating cycles of wetting (swelling) and drying (shrinking). During these cycles, the volume of the soil changes markedly. As a consequence of such volume changes, structural damage to building and infrastructure may occur if the potentially expansive soils were not considered in project design and during construction. Regional mapping by the NRCS generally indicates soils in the project have low expansion potential.

Slope Stability. Slope failure can occur in variety of ways, as either rapid movement of large masses of soil ("landslide") or slow, continuous movement ("creep") of materials. Other types of failure include spalling (the flaking off of layers of rock), or rockfall where fractured fragments of rock fall freely out of a slope face. The primary factors influencing the stability of a slope are: (1) the nature of the underlying soil or bedrock; (2) the geometry of the slope (height and steepness); (3) rainfall; and (4) the presence of previous landslide deposits. The slopes in the vicinity of the project area are variously mapped by the USGS as Slope Stability Category 2, 3, 4 or 5, which represent respectively:[113]

- Slope Stability Category 2 Generally Stable Areas of 5 to 15 percent slope;
- Slope Stability Category 3 Generally Stable to Marginally Stable areas of greater than 15 percent slope but not underlain by landslide deposit, or consisting of bedrock;
- Slope Stability Category 4 Moderately Unstable Areas of greater than 15 percent slope underlain by bedrock susceptible to landslide;
- Slope Stability Category 5 Unstable Areas – those areas of any slope that are underlain or adjacent landslide deposits.

During a site reconnaissance conducted for this ~~Draft~~ EIR analysis, numerous locations were observed where the banks of Lagunitas Creek were near-vertical and/or undercut by creek-related erosion. It is possible that slope failures will occur at these over-steepened banks at some time in the future. Several of these over-steepened banks were found adjacent to the SFDB project alignment.

[111] ABAG, 2001. Liquefaction Hazard Map. Accessed 10/5/09 at: quake.abag.ca.gov.
[112] Rauch, Alan F., 1997, EPOLLS: An Empirical Method for Predicting Surface Displacements due to Liquefaction-Induced Lateral Spreading in Earthquakes, Ph. D. Dissertation, Virginia Tech, Blacksburg, VA.
[113] Nilsen, T. H., Wright, R. H., et. al., 1979. Relative Slope Stability and Land-use Planning in the San Francisco Bay Region, California. USGS Professional Paper 944.

Further, unpaved pullouts and parking areas along the existing road were denuded of foliage and showing signs of recent erosion.

A preliminary geotechnical investigation focused on one of these over-steepened creek bank locations at Station 270+25 near the southern end of the project alignment adjacent Samuel P. Taylor Park.[114] In the area of the investigation, the roadway was constructed across a broad drainage channel above the west bank of the creek, and the placement of additional fill was used to raise the grade for the road bed. Drainage features at this location result in concentrated stormwater flow on the slope face east of the roadway and above Lagunitas Creek. This concentrated drainage has resulted in localized erosion. The unstable area is approximately 60 feet in length along the edge of the existing pavement and has resulted in the gravel shoulder dropping one to two feet. Below the shoulder, the slope ranges from about 45 degrees to near vertical, and extends down approximately 25 to 30 feet to the creek bed. The slope face is composed of loose detrital soils with rock fragments and vegetated with small trees, ferns and vines.

Settlement and Differential Settlement. Settlement or differential settlement of improvements could occur if they were built on low-strength foundation materials (including imported non-engineered fill) or if improvements straddle the boundary between different types of subsurface materials (e.g., a boundary between native material and fill). Although settlement generally occurs slowly enough that its effects are not dangerous to users, it can cause significant structural damage over time. Portions of the project area that may contain loose or uncontrolled (non-engineered) fill adjacent stable bedrock or dense alluvium may be susceptible to differential settlement. Colluvium and residual soils in the project area may be subject to heave and settlement in response to changing seasonal moisture conditions.[115]

4.5.2 Regulatory Framework

The following discussion includes a description of the regulatory context (including regulatory agencies and policy documents) for geologic and seismic issues as they relate to development on the project area.

Alquist-Priolo Earthquake Fault Zoning Act (A-PEFZA). Surface rupture is the most easily avoided seismic hazard. The A-PEFZA was passed in December 1972 to mitigate the hazard of surface faulting in structures used for human occupancy. The A-PEFZA's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The A-PEFZA only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards (the Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically-induced landslides).

The law requires the State Geologist to establish regulatory zones, known as Earthquake Fault Zones, around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and State agencies for their use in planning and controlling new or renewed construction. Local agencies must regulate most development projects within the zones.

[114] Kleinfelder, 2009. Technical Memorandum: Preliminary Geologic/Geotechnical Reconnaissance: Slope Instability, Sir Francis Drake Boulevard P.M. 15.43, Prepared for BKF Engineers. Project Number 82400/1.
[115] Kleinfelder, 2008. op. cit.

Projects include all land divisions and the development of most structures for human occupancy. Before a project can be permitted, cities and counties must require a geologic investigation of a project area to demonstrate that proposed buildings will not be constructed across active faults. The evaluation and written report of a specific site must be prepared by a licensed geologist. If an active fault is found, a structure for human occupancy must be set back 50 feet from the fault trace. The proposed project does not include structures for human occupancy. Therefore, this regulation is not directly applicable to the proposed project.

Seismic Hazards Mapping Act (SHMA). In 1990, following the 1989 Loma Prieta earthquake, the California Legislature enacted the SHMA to protect the public from the effects of strong ground shaking, liquefaction, landslides and other seismic hazards. The SHMA established a State-wide mapping program to identify areas subject to violent shaking and ground failure; the program is intended to assist cities and counties in protecting public health and safety. The SHMA requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. As a result, the California Geologic Survey is mapping SHMA Zones and has completed seismic hazard mapping for the portions of California most susceptible to liquefaction, ground shaking, and landslides: primarily the San Francisco Bay Area and Los Angeles basin. At the time of the preparation of this ~~Draft~~ EIR, the County of Marin has not yet been mapped in conformance with the SHMA, and CGS has not indicated a schedule for completion of the study.

Surface Mining and Reclamation Act. The Surface Mining and Reclamation Act (SMARA, California Public Resources Code Section 2761, et seq.) requires local governments to consider the impacts of new development on the availability of mineral resources.[116]

County of Marin, Uniform Construction Standards. The County of Marin Public Works department has adopted Uniform Construction Standards (UCS) for public works projects, as adopted 20 January 1970 and as amended and adopted 16 May 2008.[117] The UCS are maintained by the Engineering Services Division which provides Civil Engineering and Surveying services for the County. Primary functions of the Division involve the design and construction of various projects, primarily involving major improvements and repairs for County roads and flood control facilities.

County of Marin Countywide Plan Policies. The following Marin Countywide Plan Environmental Hazards Chapter goals, policies and programs are applicable to the proposed project.

GOAL EH-2: Safety from Seismic and Geologic Hazards. Protect people and property from risks associated with seismic activity and geologic conditions.

Policy EH-2.1 Avoid Hazard Areas. Require development to avoid or minimize potential hazards from earthquakes and unstable ground conditions.

> *Program EH-2.a Require Geotechnical Reports.* Continue to require any applicant for land division, master plan, development approval, or new construction in a geologic hazard area to

[116] California Department of Conservation (CDC), 1987. Mineral Land Classification Special Report 146, Map Plate 2.14, Livermore Quadrangle.
[117] County of Marin, 2009. Public Works: Uniform Construction Standards, All cities and County of Marin. Accessed at: www.co.marin.ca.us/depts/pw/main/pdfs/uniform_standards/UCS-compiled.pdf

submit a geotechnical report prepared by a State-certified Engineering Geologist or a Registered Geotechnical Engineer that:

- evaluates soil, slope, and other geologic hazard conditions;
- commits to appropriate and comprehensive mitigation measures sufficient to reduce risks to acceptable levels, including post-construction site monitoring, if applicable;
- addresses the impact of the project on adjacent lands, and potential impacts of offsite conditions; and
- meets the requirements of other agency regulations with jurisdiction in the hazard area, such as BCDC requirements for the safety of fills consistent with the Bay Plan.

Program EH-2.b Require Construction Observation and Certification. Require any work or construction undertaken to correct slope instability or mitigate other geologic hazard conditions to be supervised and certified by a geotechnical engineer and/or an engineering geologist.

Program EH-2.g Identify Compressible Soil Potential. Require that geotechnical reports for projects on land underlain by compressible materials (such as fill, bay mud, and marsh or slough areas) delineate locations where settlement will be greatest and subsidence may occur, and recommend site preparation and construction techniques necessary to reduce risk and public liability to an acceptable level.

Program EH-2.j Seek Supplemental Expertise. Continue to hire consultants expert in soils engineering as necessary for evaluating specific developments proposed on bay mud and fill prone to differential settlement.

Program EH-2.l Reliability of Lifelines and Access (Evacuation) Routes. In cooperation with utility system providers, emergency management agencies, and others, assist in the development of strategies to reduce adverse effects of geologic hazards, especially fault surface rupture and landslides to critical public lifelines, and access (i.e., evacuation) routes in an emergency.

4.5.3 Significance Criteria

Appendix G of the State CEQA Guidelines states the proposed project would result in a significant geologic, soils or seismic impact if it would have any of the following effects:

- 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;
  - Strong seismic ground shaking;
  - Seismic-related ground failure (including liquefaction); and/or
  - Landslides.
- Result in substantial soil erosion or loss of topsoil;

- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property;
- Directly or indirectly destroy a unique geologic feature;
- Result in the loss of availability of known mineral resources that would be of value to the region and the residents of the State; or
- Result in the loss of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

In addition, based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may also have a significant impact related to geologic hazards if it would be located:

- Within an Alquist-Priolo Special Studies Zone, a known active fault zone, or an area characterized by surface rupture that might be related to a fault.
- In an area with substrate consisting of material that is subject to liquefaction or other secondary seismic hazards in the event of ground shaking.
- In an area with evidence of static hazards, such as landsliding or excessively steep slopes, that could result in slope failure.
- In the vicinity of soil that is likely to collapse, as might be the case with karst topography, old mining properties, or areas of subsidence caused by groundwater drawdown.
- In an area with soils characterized by shrink/swell potential that might result in deformation of foundations or damage to structures.
- In a Mineral Resource Zone identified by the California Department of Mines and Geology.

4.5.4 Impacts and Mitigation Measures

This section identifies the potential significant geologic and seismic impacts associated with the proposed Sir Francis Drake Boulevard Rehabilitation Project. Mitigation measures are recommended, as appropriate, for significant impacts to reduce them to less-than-significant level. This section also identifies impacts that are considered to be less than significant.

(1) Located within an Alquist-Priolo Earthquake Fault Zone. No active or potentially active faults have been mapped at, or adjacent to, the project area, and no portion of the site is located within an Alquist-Priolo Earthquake Fault Zone. Therefore, the potential for fault rupture at the site is negligible.

(2) Mineral Resources. The project is not located in an area mapped by the State of California or County of Marin as a source location for known mineral resources of value to the region and residents of the State, and rehabilitation of the road would not result in the loss of known mineral resources.

(3) Soil Collapse. The underlying geology of the project area is Franciscan Complex mélange and Franciscan Complex bedrock generally mantled with a relatively thin layer of alluvial soils or fluvial deposits. The project is not located in an area with karst topography, old mining properties, or subject to subsidence caused by groundwater drawdown.

(4) Unique Geologic Feature(s). As the project is the rehabilitation of an existing roadway and does not propose extensive alteration or grading within the alignment, implementation of the project would not impact a known unique geologic feature.

(5) Erosion and Sedimentation. One of the stated goals of the project is that; "All proposed improvements shall protect environmental resources during and after construction." Included in the project description are discussions of current problems with the road and adjacent areas, including conditions resulting in erosion, as well as adverse effects of erosion and slope issues on the roadway. In part, the improvements proposed would restore specific areas where excessive erosion and slope failure has damaged the banks of Lagunitas Creek, as well as the road bed. Replacement of blocked and damaged culverts, construction of new inside ditch drainage retention and infiltration areas, and new slope retaining walls are all intended to manage stormwater more effectively along the alignment. In addition, properly engineered paved pullouts along with a reduction in informal pullouts and parking areas are intended to reduce the amount of automotive traffic that currently occurs on the soft shoulders along SFDB within the project area. Current unpaved informal pullouts would be blocked by the use of boulders or some other means, to allow these shoulders to recover a vegetative cover to help secure erodible materials. As a result of these and other improvements proposed by the project, geologically related erosion impacts from the finished project would be less-than-significant, as the finished project would result in a reduction in site conditions prone to erosion compared to existing conditions.

Additional discussion of potential erosion impacts related to stormwater management, and required compliance with National Pollutant Discharge Elimination System (NPDES) permits during the construction and operational phases of the project are discussed in Section 4.6, Hydrology and Water Quality.

Impact GEO-1: The proposed project may be subject to seismic shaking hazard impacts. (S)

The proposed project could be subject to significant impacts related to strong seismic ground shaking, seismic-related ground failure (including liquefaction), and/or seismically induced landslides. The Geotechnical Investigation found groundwater at a depth of 2 feet below ground surface (bgs) at the boring nearest Shafter Bridge, at the south end of the project area. Groundwater may be found as shallow as 5 feet bgs, depending on seasonal rainfall, temperature, groundwater withdrawals, and nearby construction activities. The Geotechnical Investigation further notes that the proximity to Lagunitas Creek, the occurrence of steep-sided surrounding slopes, and the presence of colluvium in the subgrade materials, all indicate shallow groundwater may be present, and may contribute to liquefaction issues. Liquefiable soils may be subject to temporary bearing capacity loss during an earthquake event, and may allow either total or differential vertical settlement, and may be subject to

lateral spreading. The areas with the highest risk for liquefaction-induced settlement or slope deformation are creek crossings and where the roadway is located adjacent to a creek channel.[118]

Mitigation Measure GEO-1: Prior to the commencement of the project, the Geotechnical Investigation and associated recommendations, as prepared by a licensed professional, shall be submitted to the County of Marin Public Works Engineering Division. The Geotechnical Investigation's determination of the project area's surface geotechnical conditions and potential seismic hazards such as liquefaction, lateral spreading, and landslides shall be considered in the project design. The Geotechnical Investigation's recommendations of construction techniques appropriate to minimize seismic damage shall be adopted as part of the project design and implementation plan. Some of the recommended construction techniques from the project-specific Geotechnical Investigation include:

- Full depth replacement of soft subgrade materials, such as un-engineered fill or colluvium, with engineered fill. This would be accomplished by excavation of the subgrade and replacement with select imported fill materials.
- Excavations for the removal of culverts should be cleaned of loose materials and widened as necessary to permit compaction equipment access. The excavations should be subsequently backfilled with properly compacted fill.
- Imported select fill should be of low expansion potential and free of organic matter, and should conform, in general, to the following requirements:
  - Plasticity Index less than 15%
  - Liquid Limit less than 40%
  - Percent Soil Passing #200 Sieve between 15% and 60%
  - Maximum Aggregate Size 4 inches
- Consultation with a licensed geotechnical engineer to provide the appropriate engineering specifications input for design of any required structures to withstand seismic forces.
- Finished project grading and surfaces should avoid any ponding of water or concentrated seepage under structures or adjacent to the roadway.

In addition, the following shall be implemented:

- The County of Marin Public Works Engineering Division shall review the Geotechnical Investigation along with final project plans and confirm that the proposed improvements fully comply with the County of Marin Uniform Construction Standards and that the Geotechnical Investigation recommendations have been incorporated.
- All design criteria and specifications set forth in the Geotechnical Investigation shall be implemented as a condition of project approval.

Significance After Implementation. Exposure to seismic hazards is a generally accepted part of living in the earthquake-prone San Francisco Bay Area and is reflected in more stringent construction

[118] Kleinfelder, 2008. op. cit.

codes than for non-seismically active areas; therefore, the mitigation measure described above would reduce the potential hazards associated with seismic activity to a ***less-than-significant*** level.

Impact GEO-2: Damage to proposed improvements related to expansive soils, corrosive soils, and/or settlements of non-engineered fill or disparate soils could occur. (S)

Geologic mapping included with the Geotechnical Investigation indicates surficial deposits in the project area as primarily either thinly mantled Franciscan bedrock or Holocene stream terrace deposits,[119] which correspond with the soils as mapped by the NRCS as cronkhite- or dipsea-barnabe complex clay or gravelly loams, and fluvial deposits.[120] The Geotechnical Investigation notes that expansive soils were not encountered in the eleven soil borings conducted; however, if expansive soils were found during the rehabilitation project, they could cause unacceptable damage to the future roadway, "*and recommended that soils conditions be observed during the rehabilitation process, and if expansive soils are encountered at, or adjacent, the roadway improvements that they be suitably conditioned, or replaced with engineered fill, to prevent future damage to the roadway".*[121]
The Geotechnical Investigation notes that colluvium and residual soils in the project area may be subject to heave and settlement in response to changing seasonal moisture conditions. Where improvements, such as replacement of culverts occur, the Geotechnical Investigation anticipates that full depth replacement of subsurface materials will be required in most areas. Specifically, excavation of the subgrade and replacement with select imported fill materials (i.e., Class 2 aggregate base) will be required in areas with soft subgrade conditions.

> Mitigation Measure GEO-2: The designers and engineers of proposed improvements (including roads, pullouts, parking areas, and utilities) shall consider the site's potential to be underlain by soils with moderate to high shrink-swell potential and, per the Geotechnical Investigation's recommendations, a qualified professional shall observe soil conditions in the field during the rehabilitation process. If locations along the alignment of SFDB are underlain by expansive soils and/or non-engineered fill, the geotechnical consultant to the project shall determine if the soils encountered are problematic, and shall make recommendations to ensure potential damage related to expansive soils and non-uniformly compacted fills are minimized. Mitigation options may range from removal of the problematic soils, and replacement, as needed, with properly conditioned and compacted fill, to design and construction of improvements to withstand the forces exerted during the expected shrink-swell cycles and settlements.
>
> All design criteria and specifications set forth in the Geotechnical Investigation and as made by the geotechnical consultant while monitoring the project shall be implemented to reduce impacts associated with problematic soils.
>
> The Geotechnical Investigation consultant shall include an evaluation of the potential for corrosive soils. If the results indicate corrosive soil conditions, appropriate measures to mitigate these conditions shall be incorporated into the design of project improvements, such as culverts, that may come into contact with site soils. Wherever corrosive soils are found in

[119] Kleinfelder 2008. op. cit.
[120] NRCS 2009. op. cit.
[121] Kleinfelder 2008. op. cit.

sufficient concentrations, recommendations shall be made to protect iron, steel, metal, and concrete from long-term deterioration caused by contact with corrosive onsite soils. In general, these recommendations are expected to include, but not be limited to, the following provisions:

- Protect buried iron, steel, cast iron, ductile iron, galvanized steel, and dielectric coated steel or iron (including all buried metallic piping) against corrosion from soil.
- Protect buried metal and cement structures in contact with earth surfaces from chloride ion concentrations.
- Use sulfate-resistant concrete mix for all concrete in contact with the ground.
- Consult a corrosion expert as needed during the project's detailed design phase to design the most effective corrosion protection.

Significance After Implementation. Implementation of Mitigation Measure GEO-2 would reduce the impact of expansive soils, corrosive soils, and/or settlements of non-engineered fill or disparate soils to a ***less-than-significant*** level.

Impact GEO-3: Landslide hazards could result in roadway damage, vehicle damage, and/or injuries. (S)

Generally, the current road alignment is located where steep cutslopes are above the road or the road is near the top-of-bank for Lagunitas Creek, and could be subject to undercutting during high-water flow conditions. There are numerous locations along the alignment where the banks of Lagunitas Creek are near-vertical and/or undercut by creek-related erosion. It is possible that slope failures will occur at these over-steepened banks at some time in the future. However, as determined by the Geotechnical Investigation, the project would not increase slope instability relative to existing conditions, and therefore, impacts related to slope instability are less than significant.

The Geotechnical Report notes that creek crossings may be subject to soil instability, and that the existing culvert crossings commonly coincide with pavement distress. The project would improve drainage conditions by replacing deteriorating culverts and providing new energy dissipation structures so that discharge from culverts does not cause scour (which could contribute to slope instability). For additional description of drainage issues, please refer to Section 4.6, Hydrology and Water Quality.

At a location where the roadway has experienced settlement due to slope instability, the project would include a slope repair. At Station 270+25 of the alignment, slope instability has caused settlement of 1 to 2 feet of the roadway shoulder above an over-steepened bank above Lagunitas Creek. The edge of the roadway has been thickened by multiple overlays of asphalt in an attempt to maintain the grade. The slope and roadway instability are the result of multiple factors including: 1) the original roadway was constructed on un-engineered fill over an existing slope; 2) lack of sub-drainage; and 3) poor surface drainage which contributes to slope saturation. The proposed project includes conceptual plans to repair this area by replacing subsurface materials with engineered fill and constructing a down-slope retaining wall to stabilize the slope. The retaining wall would be constructed with deep-seated tie-backs to anchor the wall. In addition, the project would construct new drainage structures

that would promote stability for the subsurface materials and minimize erosion.[122] However, only conceptual plans have been developed. If the repair was not based on a detailed and appropriate geotechnical design, it could fail. This is a significant impact. The following mitigation measure is recommended.

> Mitigation Measure GEO-3: Prior to the commencement of the project, a site-specific design-level geotechnical investigation shall be conducted of the slope instability feature at Station 270+25. The geotechnical investigation shall be prepared by a licensed geotechnical engineer and the geotechnical report shall be submitted to the County of Marin Public Works Engineering Division. The geotechnical investigation shall include documentation of geologic mapping of the site and adjacent areas, exploratory borings, appropriate laboratory testing of soils samples, and recommendations for repair of the slope instability feature. All design criteria and specifications set forth in the design-level geotechnical investigation shall be implemented as a condition of project approval.

Significance After Implementation. Implementation of Mitigation Measure GEO-3 in the project design would reduce landslide hazard impacts at Station 270+25 to ***less than significant***.

[122] Stevens, Robert, 2009. op. cit.

4.6 HYDROLOGY AND WATER QUALITY

This section describes the existing hydrology setting for the project, including runoff, drainage, flood hazards, and water quality, based on available information provided as part of the project application, published reports and a site visit conducted on October 6, 2009. The setting also includes the regulatory framework for the project. Impacts that could result from the proposed project, and mitigation measures to reduce significant impacts are identified, where appropriate.

4.6.1 Setting

The existing conditions related to hydrology and water quality of the project site are described below.

Climate. Marin County has a mild Mediterranean climate with long, dry, warm summers and cool, rainy winters. Rainfall averages from 30 to 61 inches per year.[123] Annual rainfall within the Lagunitas Creek watershed, where the project is located, varies from 28 to 52 inches, with the most intense rain occurring over Kent Lake and the upper watershed, and the driest portion in Nicasio Valley.[124]

Watershed Description. The project is within the Lagunitas Creek Watershed, and Lagunitas Creek flows directly adjacent to the project. The Lagunitas Creek watershed, which lies within the larger Tomales Bay watershed, drains 103 square miles of west central Marin County. From the headwaters on the north slope of Mount Tamalpais, Lagunitas Creek, which is a perennial stream, flows about 25 miles before discharging into Tomales Bay. The first 8 miles of Lagunitas Creek are dammed for municipal drinking water storage by the Marin Municipal Water District (MMWD); Peters Dam holds 32,900 acre-feet of water in Kent Lake, about a mile downstream from three smaller reservoirs near the headwaters – Lake Lagunitas, Bon Tempe Lake, and Alpine Lake. Major perennial tributaries to Lagunitas Creek are San Geronimo Creek, Nicasio Creek, Halleck Creek, Olema Creek, Woodacre Creek, Barnabe Creek, and Devil's Gulch Creek.

According to the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan), beneficial uses of Lagunitas Creek are cold freshwater habitat, fish migration, preservation of rare and endangered species, water contact recreation, noncontact water recreation, fish spawning, warm freshwater habitat, wildlife habitat, agricultural supply, and municipal and domestic supply.[125] Tomales Bay has the same designated beneficial uses.[126]

Lagunitas Creek is protected habitat for coho salmon, steelhead, and California freshwater shrimp, and is one of the most important coho salmon streams in California, supporting approximately 10 percent of the current population in the central California coast. The reach of Lagunitas Creek

[123] Marin County Community Development Agency, Planning Division, 2004, Marin County Watershed Management Plan Administrative Draft. Website: www.co.marin.ca.us/depts/cd/main/pdf/eir/CWP/Appendix1_Q.pdf, accessed October 7, 2009.
[124] San Francisco Bay Regional Water Quality Control Board, 2007, Water Quality Monitoring and Bioassessment in Nine San Francisco Bay Region Watersheds, 2001-2003, June 2007. Website: www.swrcb.ca.gov/water_issues/programs/swamp/docs/reglrpts/rb2_wqmb9sfws2007.pdf, accessed October 9, 2009.
[125] San Francisco Bay Regional Water Quality Control Board, 2007, San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan), incorporating all amendments as of January 18, 2007.
[126] San Francisco Bay Regional Water Quality Control Board, 2007, op. cit.

between San Geronimo and Tocaloma, especially in Samuel P. Taylor State Park, is prime habitat for these aquatic species.[127,128]

Runoff and Drainage. The portion of SFDB within the project is a winding, superelevated[129] road bordered by sloped banks greater than 45 degrees. Because SFDB is superelevated, runoff generally drains to one side of the road. The lowest and highest elevations along the centerline of SFDB within the project are 82 and 209 feet National Geodetic Vertical Datum of 1929 (NGVD). Numerous named and unnamed stream courses and minor drainages cross under the project alignment in culverts. There are 72 culverts within the project, and 47 of those culverts are sized to convey the 100-year storm, and the remainder are not.[130]

At Station 270+25, a combination of factors such as erosion, settlement of fill, lack of subdrainage, road runoff discharges, impinging flow from Lagunitas Creek at the toe of the slope, and rapid drawdown of the creek during periods of high storm flows, have created an unstable slope condition that extends approximately 60 linear feet.[131]

Flooding. Based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the project area, minor portions of the project are within Special Flood Hazard Area (SFHA) Zone A (areas subject to a 1 percent annual chance of flooding, often referred to as the 100-year flood), for which no base flood elevations have been identified (Figure 4.6-1). The portion of the project within Samuel P. Taylor State Park is not within the FEMA FIRM study area, and has therefore been designated by FEMA as Zone D (area of undetermined but possible flood hazards).

In the portions of SFDB that slope towards the adjacent hillside, rain and stormwater runoff ponds adjacent to the road before discharging into culverts. The water ponds because of the relatively flat road profile and the lack of well-defined drainage ditches. The ponding adjacent to the hillsides causes stormwater to inundate portions of SFDB during significant storm events.

Dam Inundation. The project could be subject to inundation in the event of a catastrophic failure of Peters Dam, which is located across Lagunitas Creek. The Peters Dam is located approximately 0.6 miles from the project southern terminus at the Shafter Bridge. Peters Dam was built in 1953 to form Kent Lake and was raised 45 feet in 1982 by MMWD, nearly doubling reservoir capacity from 16,600 acre feet to 33,000 acre feet.[132] Peters Dam is under the jurisdiction and control of the State Division of Safety of Dams (DSD). All reservoirs with storage capacity exceeding 50 acre-feet or with dam heights over 25 feet are permitted and inspected by the DSD.

Coastal Hazards. The project is located in proximity to Tomales Bay, the San Francisco Bay, and the Pacific Ocean/ Drakes Bay. However, the elevation of the project (between 82 and 209 feet NGVD

[127] Ibid.
[128] Marin County Community Development Agency, Planning Division, 2004, op cit.
[129] A superelevated road is a curved road where elevation of the outside edge of the curve is higher than the inside of the curve**,** to help vehicles around the curve.
[130] BFK Engineers, 2009, Sir Francis Drake Boulevard Culvert Analysis, October 12, 2009.
[131] Kleinfelder, 2009, Technical Memorandum Preliminary Geologic/Geotechnical Reconnaissance Slope Instability Sir Francis Drake Boulevard P.M. 15.43 Samuel P. Taylor State Park Marin County, California, April 30, 2009.
[132] Marin County Community Development Agency, Planning Division, 2004, Marin County Watershed Management Plan Administrative Draft. Website: http://www.co.marin.ca.us/depts/cd/main/pdf/eir/CWP/Appendix1_Q.pdf, Accessed October 7, 2009.

and distance from the coast would preclude its exposure to coastal hazards such as sea level rise, tsunamis, seiches, or extreme high tides.

Groundwater Basin. Per the Basin Plan, the project is not within a defined groundwater basin. Geotechnical borings advanced along the project alignment to depths ranging from 5.4 feet to 11.5 feet below ground surface (bgs) did not encounter groundwater, except in the boring by the Shafter Bridge, where groundwater was encountered at 2 feet bgs.[133]

Water Quality. The quality of surface water and groundwater in the vicinity of the project site is affected by past and current land uses in the watershed as well as local geology. Water quality in surface and groundwater bodies is regulated by the State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards.

Tomales Bay. Section 303(d) of the CWA requires that states make a list of waters that are not attaining water quality standards after the technology-based limits on point sources are put into place. Tomales Bay is on the 2006 Clean Water Act (CWA) 303(d) list (impaired waterbodies) due to mercury, nutrients, pathogens, and sedimentation/siltation. A Total Maximum Daily Load (TMDL)[134] has been completed for pathogens and was incorporated into the Basin Plan as an amendment on February 8, 2007. TMDLs are currently under development for mercury and sediment/siltation. On February 11, 2009 the San Francisco Bay Regional Water Quality Control Board (RWQCB) adopted a resolution approving staff's recommendations for proposed additions, deletions and changes to the 303(d) list in the San Francisco Bay Region; these changes require approval by the SWRCB and the United States Environmental Protection Agency (U.S. EPA). There are no proposed changes for Tomales Bay.

Lagunitas Creek. The Lagunitas Creek watershed (as well as the Stafford Lake watershed) supplies most of the County's domestic water.[135] Lagunitas Creek watershed water quality, sediment quality, and benthic macroinvertebrate assemblages, including locations adjacent to the project, are monitored as part of the State Board Surface Water Ambient Monitoring Program (SWAMP). A report summarizing monitoring that occurred in the Lagunitas Creek watershed and eight other watersheds from 2001-2003 did not identify any "sites of concern" within the project area.[136] However, clam tissue concentrations in samples collected from Olema Creek at the confluence of Lagunitas Creek (downstream of the project) had the highest mercury concentrations in the entire study area.

Lagunitas Creek is on the 2006 CWA 303(d) list due to nutrients, pathogens, and sedimentation/siltation. The pathogen TMDL completed for Tomales Bay also includes Lagunitas Creek. The Water Board proposes no changes on the 2008 303(d) list for Lagunitas Creek

[133] Kleinfelder, 2008, *Geotechnical Investigation Sir Francis Drake Boulevard Pavement Rehabilitation Marin County, California*, August 21, 2008.
[134] A TMDL is a written plan that describes how an impaired water body will meet water quality standards, which contains: (1) a measurable feature to describe attainment of the water quality standard(s); (2) a description of required actions to remove the impairment and; (3) an allocation of responsibility among dischargers to act in the form of actions or water quality conditions for which each discharger is responsible.
[135] Marin County Community Development Agency, Planning Division, 2004, op. cit.
[136] San Francisco Bay Regional water Quality Control Board and the University of California, Davis, 2007, *Final Technical Report, Water Quality Monitoring and Bioassessment in Nine San Francisco Bay Region Watersheds, 2001-2003*, June 2007. Website: http://www.swrcb.ca.gov/water_issues/programs/swamp/docs/reglrpts/rb2_wqmb9sfws2007.pdf, accessed October 15, 2009.

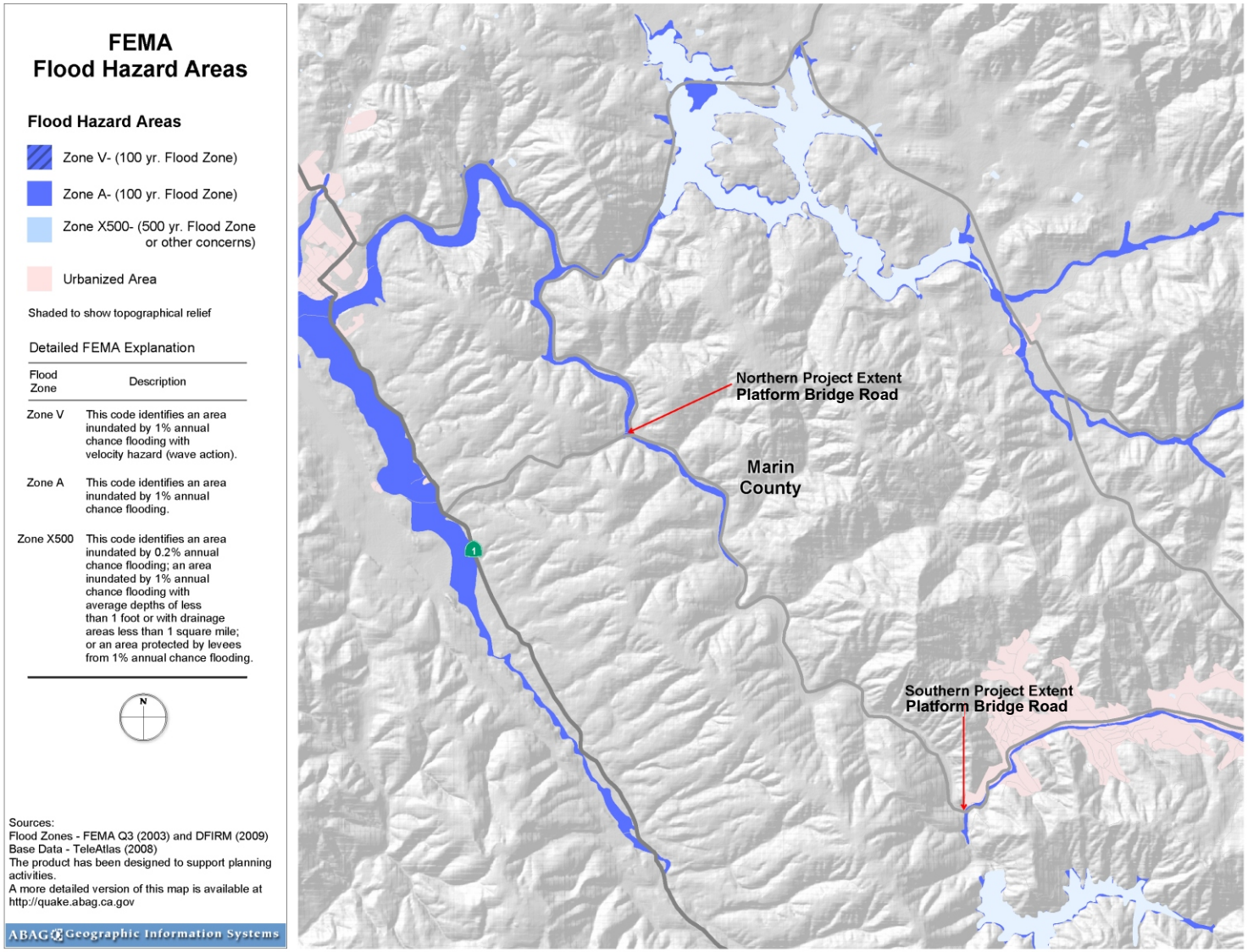

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FIGURE 4.6-1

Sir Francis Drake Roadway Improvements Project

FEMA Flood Zones

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Back of Figure 4.6-1

Groundwater Quality. Potable water wells are maintained and operated by the North Marin Water District (NMWD) [137]as part of its West Marin supply system, which serves the Pt. Reyes Station and Inverness Park communities.[138] The Pt. Reyes groundwater quality is routinely monitored by NMWD. No contaminants have been detected with the exception of occasional increases in salt concentrations.[139]

4.6.2 Regulatory Framework

Applicable federal, state, and local regulations, and local management programs and plans related to hydrology and water quality are described below.

Municipal Stormwater Program Requirements. Pursuant to Section 402 of the CWA and the Porter-Cologne Water Quality Control Act, municipal stormwater discharges in Marin County are regulated under the statewide National Pollutant Discharge Elimination System (NPDES) General Permit for the Discharge of Storm Water from Small Municipal Separate Storm Sewer Systems (Small MS4 Permit). Although prior to being regulated under the Small MS4 Permit, the municipalities in Marin County formed the Marin County Stormwater Pollution Prevention Program (MCSTOPPP) for the purpose of developing a countywide program to satisfy the requirements of the CWA and Basin Plan. The MCSTOPPP also developed a Stormwater Management Plan (Action Plan 2010) to comply with the requirements of the Small MS4 Permit. The Action Plan 2010 includes Performance Standards for the program elements that must be addressed under the Small MS4 Permit: municipal maintenance activities (including road repair and maintenance); illicit discharge controls; new development, redevelopment and construction site controls; industrial and commercial discharge controls; and public information and participation. Local Small MS4 Permit activities (MCSTOPPP) are overseen by the Water Board.

Construction General Permit. Pursuant to CWA Section 402 and the Porter-Cologne Water Quality Control Act, the SWRCB adopted an NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) (Order No. 2009-0009-DWQ, NPDES No. CAR000002) on September 2, 2009. To obtain coverage under the Construction General Permit, the discharger must provide via electronic submittal, a Notice of Intent, a Storm Water Pollution Prevention Plan (SWPPP), and other documents required by Attachment B of the Construction General Permit.

Construction activities subject to the Construction General Permit include clearing, grading, and disturbances to the ground, such as grubbing or excavation, that result in soil disturbances of at least one acre of total land area (or smaller sites that are part of a common plan of development or sale that disturbs more than one acre of land surface). A SWPPP must be prepared by a Qualified SWPPP Developer that meets the certification requirements in the Construction General Permit. The purpose of the SWPPP is to (1) to help identify the sources of sediment and other pollutants that could affect the quality of stormwater discharges; and (2) to describe and ensure the implementation of Best

[137] The MMWD serves then cities and towns (including portions of Novato) in addition to the unincorporated areas in Marin County. The NMWD serves a suburban population of 61,000 people situated in and around Novato.
[138] Marin County Community Development Agency, 2005, *Hydrology and Water Quality Technical Background Report, Marin Countywide Plan*, updated November 5, 2005.
[139] North Marin Water District, 2009, Point Reyes Area Annual Water Quality Report, April 2009. Website: www.nmwd.com/pdf/WestMarin_WQ_Report.pdf, accessed October 7, 2009.

Management Practices (BMPs) to reduce or eliminate sediment and other pollutants in stormwater as well as non-stormwater discharges resulting from construction activity. The Construction General Permit mandates certain requirements based on the risk level of the project (Level 1, Level 2, or Level 3), which is based on the risk of sediment discharge and the receiving water risk. The project would not be a Level 1 project, because a Level 1 project cannot discharge to a sensitive waterbody. Lagunitas Creek is a sensitive waterbody (on the 303(d) list as impaired for sediment and has the beneficial uses of cold freshwater habitat, fish migration, and fish spawning). Depending on the timing of the project (i.e., whether it is conducted during the rainy season or not), the project would be either Level 2 or Level 3. For Level 2 risk projects, Numeric Action Levels (NALs) for turbidity and pH are imposed, and for Level 3 risk projects, Numeric Effluent Limitations (NELs) for turbidity and pH are imposed. For Level 2 and Level 3 projects, the discharger must also prepare a Rain Event Action Plan that must be designed to protect all exposed portions of the construction site within 48 hours prior to any likely precipitation event.

The SWPPP must also include a Construction Site Monitoring Program. The monitoring program includes, depending on the project risk level, visual observations of site discharges, water quality monitoring of site discharges (pH, turbidity, and non-visible pollutants, if applicable), and receiving water quality monitoring (pH, turbidity, suspended sediment concentration, and bioassessment).

The performance standard in the Construction General Permit is that dischargers shall minimize or prevent pollutants in stormwater discharges and authorized non-stormwater discharges through the use of controls, structures, and management practices that achieve Best Available Technology (BAT) for treatment of toxic and non-conventional pollutants and Best Conventional Technology (BCT) for treatment of conventional pollutants.[140] The permit also imposes numeric action levels and numeric effluent limits for pH and turbidity (for Level 2 and Level 3 risk dischargers).

Local General Construction Permit activities are overseen by the Water Board.

Marin Countywide Plan. The Water Resources and Environmental Hazards elements of the Marin Countywide Plan contain the following policies related to hydrology and water quality.[141]

Policy WR-1.1: Protect Watersheds and Aquifer Recharge. Give high priority to the protection of watersheds, aquifer-recharge areas, and natural drainage systems in any consideration of land use.

Policy WR-1.3: Improve Infiltration. Enhance water infiltration throughout watersheds to decrease accelerated runoff rates and enhance groundwater recharge. Whenever possible, maintain or increase a site's predevelopment infiltration to reduce downstream erosion and flooding.

Policy WR-2.1: Reduce Toxic Runoff. Reduce the volume of urban runoff from pollutants — such as pesticides from homes, golf courses, cleaning agents, swimming pool chemicals, and road oil and of excess sediments and nutrients from agricultural operations.

[140] As defined by U.S. EPA, Best Available Technology (BAT) is a technology-based standard established by the CWA as the most appropriate means available on a national basis for controlling the direct discharge of toxic and non-conventional pollutants to navigable waters. The BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable. Best Conventional Technology (BCT) is a technology-based standard that applies to treatment of conventional pollutants, such as total suspended solids.
[141] Marin County Community Development Agency, 2007, Marin Countywide Plan, November 6, 2007.

Policy WR-2.3: Avoid Erosion and Sedimentation. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and on-site sediment retention. Require developments to include on-site facilities for the retention of sediments, and, if necessary, require continued monitoring and maintenance of these facilities upon project completion.

Policy WR-2.4: Design County Facilities to Minimize Pollutant Input. Design, construct, and maintain County buildings, landscaped areas, roads, bridges, drainages, and other facilities to minimize the volume of toxics, nutrients, sediment, and other pollutants in stormwater flows, and continue to improve road maintenance methods to reduce erosion and sedimentation potential.

Policy EH-2.4: Protect Coastal Areas from Tsunamis. When inundation maps become available, address tsunami wave run-up and inundation when reviewing proposed development along coastal areas of Marin County.

Policy EH-3.2: Retain Natural Conditions. Ensure that flow capacity is maintained in stream channels and floodplains, and achieve flood control using biotechnical techniques instead of storm drains, culverts, riprap, and other forms of structural stabilization.

Marin County Municipal Code. The following sections of the Marin County Municipal Code Title 23 (Natural Resources) address relevant issues for hydrology and water quality.

- *Chapter 23.09: Floodplain Management.* This chapter includes methods and provisions for:
  (a) Restricting uses which are dangerous to health, safety and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;
  (b) Requiring that uses vulnerable to flood, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
  (c) Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;
  (d) Controlling filling, grading, dredging and other development which may increase flood damage;
  (e) Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

Floodplain Management provisions include:

- Basis for Establishing the Areas of Special Flood Hazard (areas identified by FEMA or the Federal Insurance Administration in a scientific and engineering report entitled "Flood Insurance Study for Marin County, California, Unincorporated Areas" dated November 19, 1986, and accompanying flood insurance rate maps and flood boundary and floodway maps, and all subsequent amendments to and/or revisions).
- Establishment of the floodplain.
- Establishment of permit requirements.
- Standards of construction.
- Floodways: Prohibit encroachments, including fill, new construction, substantial improvements and other development, unless certification by a registered civil engineer is provided demonstrating that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.

- Coastal high hazard areas.

- *Chapter 23.18: Urban Runoff Pollution Prevention Ordinance.* The purpose of the ordinance is to ensure the future health, safety and general welfare of Marin County residents, and to protect and enhance the water quality of local watercourses, water bodies and wetlands in a manner pursuant to and consistent with the CWA and the Porter-Cologne Water Quality Control Act by:
  (a) Minimizing discharges other than storm runoff to storm drains or watercourses;
  (b) Controlling the discharge to storm drains or watercourses from spills, dumping or disposal of materials other than rain water;
  (c) Reducing pollutants in stormwater discharges to the maximum extent practicable;
  (d) Complying with the County's Small MS4 Permit, which requires implementation of appropriate source control, site design, and stormwater treatment measures for projects;
  (e) Maintaining pre-development stormwater runoff rates and preventing nonpoint source pollution whenever possible, through stormwater management controls and ensuring that these management controls are properly maintained.

  General provisions of the ordinance include:
  - The discharge of non-stormwater discharges to a county storm drain is prohibited. All discharges of material other than stormwater must be in compliance with a NPDES permit issued for the discharge (23.18.061 provides exceptions to the discharge prohibition).
  - Compliance with best management practices.
  - Illicit discharge and illicit connections.
  - Reduction of pollutants in urban runoff.
  - Littering.
  - Best management practices for new developments and redevelopments.
  - Watercourse protection.

- *Chapter 24.04.625: Erosion and Sediment Control*. When required by the County, a project shall have an erosion and sediment control plan that addresses both interim (during construction) and final (post construction) control measures. The specific control measures to be utilized shall be subject to the review and approval of the County and shall be in general accordance with the current "Manual of Standards for Erosion and Sediment Control Measures" published by the Association of Bay Area Governments. The plan shall be implemented by October 15th or earlier if so required by the County. In addition, grading operations shall not be conducted during the rainy season (October 15th through April 15th) without prior approval from the County.

- *Chapter 24.04.627: Surface Runoff Pollution Control Plan.* Where required by the nature and extent of a proposed project, and where deemed appropriate by the County, a project shall have a SWPPP which addresses both temporary (during construction) and permanent (post construction) BMPs to control erosion and sedimentation and to prevent pollutants from entering storm drains, drainage systems and watercourses. The SWPPP may incorporate the erosion and sediment control plan, as described in Chapter 24.04.625. The specific BMPs to be used shall be subject to the review and approval of the County and shall be in general accordance with current maximum extent practicable standards and technology for BMPs, the County's current municipal stormwater NPDES permit (as defined in Section 23.18.030), the current Stormwater Management Plan (Action Plan) for the cities and County of Marin, and the requirements of Chapter 23.18. Where required by the nature and extent of a proposed project and where deemed appropriate by the County, a project shall include a stormwater control plan section within the SWPPP. The

stormwater control plan shall address permanent BMPs that control pollutant sources, treat runoff, and control the rate and duration of runoff that meet the criteria in the most recent version of the Guidance for Applicants: Stormwater Quality Manual for Development Projects in Marin County, and the applicable development runoff requirements of Chapter 23.18.

Requirements for Working within Creeks. Refer to the Biological Resources section of this ~~Draft~~ EIR for a discussion of a CWA Section 401 Water Quality Certification, CWA Section 404 Permit (Discharge of Fill or Dredge Materials), and the California Department of Fish and Game Streambed Alteration Agreement.

Lagunitas Creek Sediment and Riparian Management Plan. The State Board directed the MMWD to implement a sediment and riparian management plan for the Lagunitas Creek watershed as one of several mitigation measures for enlarging Kent Lake in 1982 (State Board Order WR 95-17). The goals of the plan are to: (1) provide an appreciable, long-term improvement to streambed conditions for the benefit of Coho salmon and steelhead; and (2) enhance instream fish habitat through riparian vegetation management and by placement of woody debris. The plan also includes nearly a dozen objectives that include strictly minimizing fine sediment input to the creek, improving habitat areas with woody debris, and establishing and protecting riparian vegetation along the creek. The MMWD is also in the beginning stages of developing a new Lagunitas Creek Fisheries Management Plan, which includes implementation of sediment control measures and water quality monitoring.

Tomales Bay Watershed Council. In December 1999, local citizens and state, federal, and local agencies formed the Tomales Bay Watershed Council. The Council produced a Stewardship Plan[142] for the Tomales Bay watershed to ensure that water quality in Tomales Bay and its tributary streams is sufficient to support natural resources and beneficial uses. The plan also includes recommendations to restore and protect the integrity of natural habitats and native plant communities, which contribute to improved water quality.

FishNet 4C Program. The County actively participates in the FishNet 4C Program. The FishNet 4C Program is a County-based salmonid protection and restoration program that brings together the six Central California Coastal Counties (4C) of Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, and Monterey. The mission of the FishNet 4C Program is to restore California's listed and declining natural salmon and steelhead populations to levels that are healthy, sustainable and support a productive fishing industry within the region. Since its inception in 1998, FishNet has provided the coordination for the Central California Coastal Counties to move forward with programs for salmon and fishery restoration. The focus of the FishNet program is on implementing on-the-ground restoration projects, employing best management practices related to protecting water quality, aquatic habitat and salmonid fisheries during maintenance activities, and incorporating aquatic habitat protections into land use regulations and policies. The FishNet 4C Program has developed Guidelines for Protecting Aquatic Habitat and Salmon Fisheries for County Road Maintenance.[143]

[142] Tomales Bay Watershed Council, 2003, Tomales Bay Watershed Stewardship Plan: a Framework for Action, July 2003.
[143] FishNet 4C, MFG, Inc., and Pacific Watershed Associates, 2004. County Road Maintenance Guidelines for Protecting Aquatic Habitat and Salmon Fisheries. Updated 2007. Website: fishnet.marin.org/projects_roads_manual.html, accessed November 1, 2009.

4.7.3 Significance Criteria

The project could have a significant effect on hydrology or water quality if it would:

- Violate any water quality standards or waste discharge requirements.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a significant net deficit in aquifer volume or a lowering of the local groundwater table level.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrade water quality.
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
- Expose people or structures to a substantial risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Be inundated by seiche, tsunami, or mudflow.

4.7.4 Impacts and Mitigation Measures

This section analyzes the impacts related to hydrology and water quality that could result from implementation of the project. Mitigation measures are provided for significant impacts to reduce potentially significant impacts to a less-than-significant level.

(1) Groundwater. The project would not deplete groundwater supplies or interfere substantially with groundwater recharge. Dewatering during the construction period would likely be required, however dewatering would only result in a temporary effect on the local uppermost water-bearing zones related to near-surface excavations. The project would increase the paved areas from approximately 655,000 square feet to 703,000 square feet. Option A would add an additional 8,540 square feet of paved shoulder. The increase in impervious areas could decrease infiltration and groundwater recharge. However, the increase in impervious area is primarily due to paving of unpaved pullouts. These pullouts, due to compaction, are not currently providing significant infiltration. Therefore, the project impacts on groundwater recharge would be less than significant.

(2) Runoff. The project would not significantly alter the drainage pattern of SFDB, nor would it alter the course of Lagunitas Creek. If the project were to increase runoff flow rates, it could

contribute to stream channel hydromodification.[144] The project would resurface an existing roadway with only minor modifications (e.g., creation of new paved turnouts) and add 2,000 linear feet of retaining walls. The addition of the paved turnouts would not cause substantial modification of drainage patterns because the existing unpaved pullouts are compacted (therefore runoff that is discharged is similar to a paved area), and runoff is routed to the nearest storm drain or culvert. For the project condition, runoff from the paved pullouts would similarly be routed to the nearest storm drain or culvert, and because there would be no significant changes in grading, the drainage would be similar to the existing condition.

The retaining walls would be designed such that runoff would infiltrate through the backfill material and discharge through or beneath the wall onto the road, and the drainage pattern would be similar to the existing condition. In locations where the road slopes toward the hillside, runoff from the retaining walls would discharge to vegetated swales that would be designed with underdrains to reduce ponding that inundates the road during significant events in the existing condition.

In addition, the project would reduce erosion resulting from culvert discharges by installing energy dissipation devices, reconstructing and stabilizing eroding slopes, and installing riprap where culverts discharge outside of the banks of Lagunitas Creek. New energy dissipation devices would be installed at outfalls based on the site reconnaissance that was conducted to evaluate existing erosion and other physical conditions at the outfalls, and potential for future erosion to occur. The project also includes bank slope stabilization at Station 270+25 to repair an unstable slope that is eroding and contributing to siltation.

Table 4.6.A shows the 2-year and 10-year pre-project and project peak flow rates from the outfalls into Lagunitas Creek where the project contributes to the outfall drainage area; 2-year and 10-year calculations are provided to show a range of peak flows for more frequently occurring storms that could contribute most substantially to erosion (as opposed to the 100-year storm). Table 4.6A demonstrates that the increase in peak flow rates resulting from the project would be less than one percent, which is not considered a significant increase. Therefore, the potential for the project to cause substantial erosion or siltation as a result of altering the drainage patterns of a site or altering the course of Lagunitas Creek would be less than significant, as the project would provide a beneficial impact because it is improving erosive conditions. Other erosion and siltation issues associated with the construction period are addressed under Impact HYD-1

(3) Flooding. The project would not place housing in a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary, FIRM, or other flood hazard delineation map because the project would build no housing.

The project would not place structures within a 100-year flood hazard area that could impede or redirect flood flows. The project would add approximately 900 cubic yards of paving material as part

[144] Stream channel hydromodification refers to changes in the velocity, volume, and duration of runoff entering a stream channel in a way that can adversely impact aquatic ecosystems, and cause streambank erosion and physical modifications.

Table 4.6.A: Pre- and Post-Project Peak Flow Rates at Outfalls to Lagunitas Creek

		2-Year Storm				10-Year Storm			
Outfall No.	Outfall Drainage Area [sq ft]	Existing Peak Flow Rate [cfs]	Project Peak Flow Rate [cfs]	Change in Peak Flow Rate [cfs]	Change in Peak Flow Rate [%]	Existing Peak Flow Rate [cfs]	Project Peak Flow Rate [cfs]	Change in Peak Flow Rate [cfs]	Change in Peak Flow Rate [%]
1	134,622	7.11	7.13	0.02	0.21%	7.18	7.20	0.03	0.36%
2	225,175	11.86	11.88	0.02	0.20%	12.07	12.11	0.04	0.33%
6	315,732	16.73	16.76	0.03	0.15%	16.83	16.88	0.04	0.25%
7	214,027	11.43	11.43	0.01	0.05%	11.52	11.53	0.01	0.09%
8	99,227	5.17	5.17	0.00	0.05%	5.32	5.32	0.00	0.08%
9	74,073	3.93	3.90	-0.02	-0.56%	4.11	4.08	-0.04	-0.90%
16	235,924	12.69	12.70	0.00	0.02%	12.70	12.71	0.00	0.03%
17	190,111	10.36	10.37	0.01	0.11%	10.41	10.43	0.02	0.18%
19	32,554,583	998.40	998.39	-0.01	0.00%	998.57	998.56	-0.02	0.00%
20	105,786	5.90	5.90	0.00	-0.06%	5.93	5.92	-0.01	-0.10%
21	241,879	12.69	12.69	0.00	0.00%	12.82	12.82	0.00	0.00%
22	109,244	6.16	6.13	-0.03	-0.54%	6.37	6.31	-0.06	-0.88%
23	721,895	32.86	32.86	0.00	-0.01%	32.91	32.91	-0.01	-0.02%
24	598,625	30.75	30.77	0.02	0.05%	30.85	30.88	0.03	0.09%
26	135,737	8.26	8.26	0.00	0.04%	8.27	8.28	0.01	0.06%
27	168,212	9.46	9.47	0.01	0.10%	9.50	9.52	0.02	0.16%
28	414,999	21.24	21.26	0.02	0.12%	21.73	21.77	0.04	0.19%
35	313,840	15.70	15.73	0.03	0.20%	15.76	15.81	0.05	0.33%
36	199,565	10.58	10.62	0.04	0.42%	10.70	10.78	0.08	0.70%
37	510,901	23.86	23.93	0.07	0.31%	24.04	24.17	0.12	0.51%
38	621,293	30.42	30.44	0.02	0.05%	30.46	30.49	0.03	0.08%
39	272,021	14.63	14.65	0.02	0.13%	14.65	14.68	0.03	0.22%
40	216,288	11.70	11.72	0.03	0.23%	11.73	11.78	0.04	0.38%

Outfall No.	Outfall Drainage Area [sq ft]	2-Year Storm				10-Year Storm			
		Existing Peak Flow Rate [cfs]	Project Peak Flow Rate [cfs]	Change in Peak Flow Rate [cfs]	Change in Peak Flow Rate [%]	Existing Peak Flow Rate [cfs]	Project Peak Flow Rate [cfs]	Change in Peak Flow Rate [cfs]	Change in Peak Flow Rate [%]
42	153,904	7.97	8.00	0.03	0.35%	8.06	8.11	0.05	0.57%
43	155,110	7.71	7.76	0.04	0.58%	7.97	8.05	0.08	0.93%
44	125,914	6.95	6.98	0.03	0.49%	7.09	7.15	0.06	0.81%
45	52,720	3.06	3.07	0.01	0.17%	3.16	3.17	0.01	0.28%
46	14,973	0.89	0.89	0.00	0.02%	0.94	0.94	0.00	0.03%
51	207,142	11.63	11.64	0.00	0.01%	11.68	11.68	0.00	0.02%
55	469,322	24.18	24.16	-0.02	-0.08%	24.33	24.30	-0.03	-0.13%
56	722,492	35.66	35.67	0.01	0.03%	35.79	35.82	0.02	0.06%
57	119,060	6.65	6.67	0.02	0.24%	6.76	6.79	0.03	0.39%
58	226,088	11.70	11.71	0.02	0.13%	11.84	11.87	0.03	0.21%
60	348,175	18.87	18.90	0.03	0.16%	19.02	19.07	0.05	0.27%
61	1,120,404	54.68	54.69	0.01	0.01%	54.77	54.78	0.01	0.02%
62	409,256	22.52	22.55	0.03	0.13%	22.76	22.80	0.05	0.21%
63	584,741	29.27	29.26	0.00	0.00%	29.36	29.36	0.00	0.00%
64	579,347	28.59	28.60	0.01	0.04%	28.66	28.68	0.02	0.07%
65	1,193,254	58.61	58.64	0.03	0.06%	58.80	58.86	0.06	0.09%
66	552,917	28.56	28.65	0.10	0.34%	28.89	29.05	0.16	0.56%
67	136,065	7.61	7.61	0.00	0.03%	7.62	7.63	0.00	0.05%
71	481,755	25.66	25.66	0.00	0.00%	25.71	25.71	0.00	0.00%
72	25,676	1.25	1.25	0.00	0.00%	1.53	1.53	0.00	0.00%

Source: BKF Engineers, March 2010.
Note: Only outfalls where the project contributes to the outfall drainage area are included in the table; the table does not include outfalls that only convey runoff from the hillside and not from the project.

of the roadway rehabilitation process, resulting in raising the elevation of the roadway and pullouts by six inches. Generally, placement of fill or structures in the floodplain reduces the flood-carrying capacity of the stream channel, may increase flood heights and velocities, and increases flood hazards beyond the encroachment areas due to backwater and/or downstream effects. However, as shown in Figure 4.6-1, only a small portion of the project is located within a SFHA, and no fill would be placed within the floodway[145] of Lagunitas Creek, in accordance with Title 23, Chapter 23.09.038 of the Marin County municipal code. Surrounding land uses are primarily recreational and there are limited sensitive receptors upstream and downstream of the project. The receptors include a few residences upstream of the SFHA on State Park property, and the McIsaac Ranch, which is located at the western end of the project. Therefore, because the project would only add fill to a small portion of a SFHA, which would not be in the floodway, and there are limited sensitive receptors, the potential for the project to impede or redirect flood flows would be less than significant.

The project would not significantly alter the drainage pattern of the area, or alter the course of Lagunitas Creek in a manner that would result in on- or off-site flooding. The project entails implementing drainage improvements that include replacing currently undersized culverts and replacing them with properly-sized culverts to convey the 100-year storm. With implementation of the project, only two of the replaced culverts would not be sized to convey the 100-year storm, but in all cases the new culverts would be either larger or the same size as the existing culverts. Based on the project design, the slope of the road and drainage patterns would not change significantly. The project also proposes drainage improvements where SFDB slopes toward the hillside and flooding occurs in the existing condition; flooding in these areas would be reduced by installing the project drainage improvements and water quality features (bioswales and sand filters), which would have positive drainage using subdrains and would reduce ponding of water.

(4) Stormwater. The project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems. The project would replace most of the 72 existing culverts, 27 of which are currently undersized to convey 100-year storm flows. New culverts that would be installed as part of the project would match the existing culvert size, or would be larger in diameter than the existing culverts and adequately sized to convey 100-year flood flows. Therefore, the potential for the project to exceed the capacity of existing or planned stormwater drainage systems would be less than significant. The potential for the project to provide substantial additional sources of polluted runoff is addressed under Impact HYD-1.

The project would replace the existing concrete and asphalt concrete pavement with rubberized asphalt concrete (RAC). Use of RAC would not result in significant adverse water quality impacts to Lagunitas Creek compared to the use of other paving materials. A study conducted by New York State Department of Environmental Conservation on crumb rubber leaching from artificial turf fields (crumb rubber is also used to manufacture RAC) showed that no organic compounds were detected in stormwater runoff. Detected metals included zinc, copper, lead, and nickel; all detected metals concentrations were below surface water quality standards.[146] A study conducted by the National Cooperative Highway Research Program showed that toxicity of asphalt rubber leachate to aquatic

[145] The floodway is the channel of a river or other watercourse, plus any adjacent floodplain areas designated by a public agency, which must be kept free of encroachment so that the 100-year flood discharge can be conveyed without cumulatively increasing the water-surface elevation above the base flood elevation (BFE).
[146] Lim, L. and R. Walker, 2009, *An Assessment of Chemical Leaching, Releases to Air and Temperature at Crumb-Rubber Infilled Synthetic Turf Fields*, New York State Department of Environmental Conservation, May.

organisms is significantly reduced after "raw" asphalt rubber is assimilated into pavement. In addition, the measured toxicity was completely eliminated by soil sorption (road runoff was directed toward adjacent soils prior to discharging into receiving waters and the soil acted as a "filter").[147] Finally, Assembly Bill 338, which was passed in 2005, requires Caltrans to gradually phase in the use of crumb rubber, which is used to make RAC, on state highway construction and repair projects, to the extent feasible. Therefore, RAC is a common road paving material in California and its use is required for many projects under State law.

(5) Dam Inundation. The project would not expose people or structures to risk from flooding resulting from dam failure. The project is within the inundation area if Peters Dam failed. However, dam oversight is provided by the DSD, including annual inspections to ensure that the dam is safe. The dam owner must implement corrective actions and maintenance if required by the DSD. Therefore with DSD oversight, the hazard from flooding due to dam failure inundation would be less than significant.

(6) Tsunami or seiche. The project would not expose people or structures from significant risk from inundation by a tsunami or seiche. The Marin County Emergency Operations Plan states that potential danger from tsunami inundation exists for all areas within one mile of the coast and less than 50 feet above sea level for tsunamis of distant origin, and for all areas within one mile of the coast and less than 100 feet above sea level for tsunamis of local origin.[148] The northern boundary of the project is approximately 5.6 miles from the Coast (Drakes Bay), and therefore the risk from tsunami inundation would be less than significant. Tidal records for San Francisco Bay have been maintained for over 100 years, and during this period, a damaging seiche has not occurred. A seiche of approximately 4 inches occurred during the 1906 earthquake, an event of magnitude 8.3 on the Richter scale. It is probable an earthquake similar to the 1906 event would be the largest experienced in the Bay Area;[149] consequently a seiche larger than 4 inches is considered unlikely to occur. Moreover, the risk of a seiche occurring at Kent Lake is highly unlikely, and the impacts would be less than significant. The project elevation would also preclude inundation resulting from extreme high tide and future sea level rise. Refer to Geology, Soils, and Seismicity section for a discussion of the risk from mudflows and other landslides.

(7) Ongoing Maintenance Activities. In the project operational phase, ongoing maintenance activities such as vegetation management, culvert sediment removal, maintenance of vegetated swales and the permeable friction course, and road repair activities (which could be similar to the construction period activities, but smaller in scale) such as pothole patching and pavement marking, would not have a significant adverse effect on water quality. Implementation of the project would reduce the frequency of certain road repair activities, such as pavement patching, which could impair water quality if BMPs are not implemented. In addition, the Marin County DPW must comply with the Municipal Maintenance Performance Standards identified in MCSTOPPP's Action Plan 2010, Appendix A, to minimize adverse water quality impacts from ongoing maintenance activities.

[147] Nelson, P. *et al.*, 2001, *Environmental Impact of Construction and Repair Materials on Surface and Ground Waters, Summary of Methodology, Laboratory Results, and Model Development*, National Cooperative Highway Research Program Report 448.
[148] Marin County Sheriff's Office of Emergency Services, 2008, *Marin Operational Area Emergency Operations Plan*, July 2008.
[149] Working Group on California Earthquake Probabilities, 2003, *Earthquake Probabilities in the San Francisco Bay Region: 2002–2031***,** United States Geological Survey Open-File Report 03-214, Appendix D. "Magnitude and Area Data for Strike Slip Earthquakes," Dr. William L. Ellsworth, Research Seismologist, USGS.

Implementation of these Performance Standards is required by the Small MS4 Permit. These Performance Standards address street sweeping, storm drain facility maintenance, litter control, and road repair and maintenance (general practices, asphalt/concrete removal, patching and resurfacing, signing and striping, and equipment clean up/storage). The County also participates in the FishNet 4C Program, and DPW will implement water quality BMPs in the FishNet 4C Roads Manual[150] during project construction and during ongoing maintenance activities. These BMPs were developed to protect Coho and Chinook salmon and steelhead trout: Chapter 5 of the FishNet 4C Manual addresses road maintenance, Chapter 6 addresses working near streams, Chapter 7 addresses erosion and sediment management, and Chapter 8 addresses vegetation management. With implementation of the Small MS4 Permit Municipal Maintenance Performance Standards and the FishNet 4C water quality BMPs, impacts resulting from project operational period maintenance activities would be reduced to a less-than-significant level.

Impact HYD-1: Construction period and operation period activities could generate stormwater runoff that could cause or contribute to a violation of water quality standards or waste discharge requirements, or otherwise substantially degrade the water quality of Lagunitas Creek and/or Tomales Bay. (S)

Construction-Period Impacts. Activities will include placement of road material (approximately 900 cubic yards), grading (minor cuts and fills), saw cutting, asphalt grinding, replacement of culverts, soil excavation and stockpiling (less than 5,000 cubic yards), pavement cracking, asphalt paving, signing and striping, low retaining wall construction, and removing 8 trees for slope repair and nine trees under Option A. In addition, hazardous materials could be used or encountered during construction. If not properly controlled, construction activities could result in the discharge of sediment (and pollutants bound to sediment such as metals), asphalt materials, concrete, fuels, oils, paints, solvents, and other potentially hazardous materials into Lagunitas Creek. This is a significant impact.

Operation-Period Impacts. The project entails widening the road in certain locations and paving a few pullouts that are currently unpaved, increasing the paved area approximately from 655,000 square feet to 703,000 square feet. As a result of the increased impervious surface, the runoff volume generated from the 2-year, 24-hour storm would increase from 331,000 cubic feet in the existing condition to 333,500 cubic feet for the project (an increase of 2,500 cubic feet).[151] Option A would include an additional 8,540 square feet of paved area. An increase in impervious area can increase the surface area on which roadway pollutants (e.g., sediment, metals, fuels, oil and grease) could be deposited, come into contact with stormwater runoff, and discharge into Lagunitas Creek. This is a significant impact.

> Mitigation Measure HYD-1a: Prior to construction, consistent with the requirements of the Construction General Permit, the County shall prepare a SWPPP designed to reduce potential impacts to surface water quality through the project construction period. The SWPPP shall be prepared by a Qualified SWPPP Developer. The SWPPP shall include, as applicable, all Best Management Practices (BMPs) required in Attachment D for Risk Level 2 dischargers, or Attachment E for Risk Level 3 dischargers (as appropriate based on final determination of the

[150] FishNet 4C, MFG, Inc., and Pacific Watershed Associates, 2004, op cit.
[151] Runoff volume analysis provided by BKF Engineers, March 2010.

project's Risk Level status). The SWPPP shall include a construction site Monitoring Program that includes requirements for dry weather visual observations of pollutants at all discharge locations, and as appropriate (depending on the Risk Level), sampling of the site effluent or receiving waters (receiving water quality monitoring is only required for some Risk Level 3 dischargers). The County shall also prepare a Rain Event Action Plan as part of the SWPPP. BMP implementation shall be consistent with the BMPs requirements in the California Stormwater Quality Association Stormwater Best Management Handbook-Construction.[152] Following are the types of BMPs that shall be implemented, subject to review and approval by the Water Board.

Erosion Control BMPs

- *Scheduling*. To reduce the potential for erosion and sediment discharge, construction shall be scheduled to minimize ground disturbance during the rainy season. The project applicant shall:
  - Sequence construction activities to minimize the amount of time that soils remain disturbed.
  - Stabilize all disturbed soils as soon as possible following the completion of ground disturbing work.
  - Install erosion and sediment control BMPs prior to the start of any ground-disturbing activities.
- *Preservation of Existing Vegetation*. Where feasible, existing vegetation shall be preserved to provide erosion control.
- *Stabilize Soils*. Hydroseeding and geotextile fabrics shall be used, as appropriate, to reduce erosion.
- *Stabilize Streambanks*. When working along stream banks or within channels, BMPs shall be implemented to minimize channel erosion and sedimentation. Proper erosion and sediment controls, such as silt fences, mulch, geotextiles, and hydroseeding, shall be used. To the extent possible, existing vegetation that stabilizes the stream banks shall be preserved. While working within a stream channel, a barrier to isolate the work area shall be created, divert the stream around the work site, or employ practices to minimize sediment suspension.
- *Drainage Swales*. Construct drainage swales to divert runoff away from exposed soils and stabilized areas, and redirect the runoff to a desired location.
- *Outlet Protection and Velocity Dissipation Devices*. Install rock or concrete rubble at culvert and pipe outlets to prevent scour of the soil caused by concentrated high-velocity flows.

[152] California Stormwater Quality Association, 2003a, Stormwater Best Management Handbook-Construction, with updates through 2006. Website: http://www.cabmphandbooks.com/Construction.asp, accessed November 2, 2009.

Sediment Control BMPs

- *Silt Fence/Fiber Roll*. Silt fences or fiber rolls shall be installed around the perimeter of the areas affected by construction, at the toe of slopes, around storm drain inlets, and at outfall areas, to prevent offsite sedimentation.
- *Slope Protection and Vacuuming*. When working adjacent to the Lagunitas Creek on steep banks, a barrier shall be erected and equipment capable of vacuuming sediment shall be provided during pavement grinding and excavation operations.
- *Storm Drain Inlet Protection*. Storm drains shall be protected using a filter fabric fence, gravel bag barrier, or other methods, to allow sediments to be filtered or settle out before runoff enters drain inlets.
- *Sand Bag or Gravel Bag Berm*. Sand or gravel bags shall be installed as a linear erosion or sediment control measure to pond sheet flow runoff and reduce the discharge of sediment.

Wind Erosion Control BMPs

- *Dust Control*. Potable water shall be applied using water trucks to alleviate nuisance caused by dust. Water application rates shall be minimized to prevent erosion and runoff.
- *Stockpile Management*. Silt fences shall be used around the perimeter of stockpiles and stockpiles shall be covered with plastic to prevent wind dispersal of sediment.

Tracking Controls

- *Stabilized Construction Entrance/Exit*. Construction site entrances and exits, the equipment yard, the water filling area for water trucks, and the project office location, shall be graded and stabilized to prevent runoff from the site and erosion.
- *Tire Wash*. A tire washing facility shall be installed to allow for tire washing when vehicles exit the site to prevent tracking onto public and private streets.

Non-Stormwater Controls

- *Dewatering.* The SWPPP shall include a dewatering plan for non-contaminated groundwater specifying methods of water collection, transport, treatment, and discharge. The discharger shall consult with the Water Board regarding any required permit (other than the Construction General Permit) or Basin Plan conditions prior to initial dewatering activities to land, storm drains, or waterbodies. Water produced by dewatering shall be impounded in holding tanks or other holding facilities to settle the solids and provide other treatment as necessary prior to discharge to receiving waters. Discharges of water produced by dewatering shall be controlled to prevent erosion.
- *Illicit Connection/Discharge Detection and Reporting*. Contractors shall regularly inspect the site for evidence of illicit connections, illegal dumping, or discharges. Such discharges shall immediately be reported to the stormwater illegal discharge contact for Marin County.
- *Vehicle and Equipment Cleaning*. Construction equipment shall be washed regularly in a designated enclosed area. Except for concrete washout, vehicle cleaning shall not be performed on site. Concrete washout waste will be contained and managed properly.

- *Vehicle and Equipment Fueling and Maintenance*. Self-propelled vehicles shall be fueled off-site or at the temporary fueling area. Fuel trucks equipped with absorbent spill clean-up materials shall be used for all on-site fueling; the fuel truck shall be parked on the paved fueling area for overnight storage. Drip pans shall be used for all mobile fueling. Drip pans or absorbent pads shall be used for all vehicle and equipment maintenance activities. Vehicle maintenance and mobile fueling operations shall be conducted on a level graded area, at least 50 feet away from operational inlets and drainage facilities.
- *Paving and Grinding Operations*. Proper practices shall be implemented to prevent run-on and run-off, and to properly dispose of waste. Paving and grinding activities shall be avoided during the rainy season, when feasible.
- *Structure Demolition*. Potable water shall be sprayed during road demolition to control dust.

Waste Management and Materials Pollution Control BMPs

- *Material Delivery, Storage and Use*. The general material storage area shall be located in the contractor's yard. Two watertight shipping containers shall be used to store hand tools, small parts, and most construction materials that can be carried by hand, such as paint cans, solvents and grease. Very large items, such as light standards, framing materials, and stockpiled lumber, shall be stored in the open in the general storage area. Such materials shall be elevated with wood blocks to minimize contact with run-on. Spill clean-up materials, material safety data sheets, a material inventory, and emergency contact numbers shall be maintained at the site.
- *Spill Prevention and Control*. Proper procedures shall be implemented to contain and clean-up spills and prevent material discharges into the storm drain system.
- *Solid Waste Management*. Solid wastes shall be loaded directly into trucks for off-site disposal. When on-site storage is necessary, solid wastes shall be stored in watertight dumpsters in the general storage area of the contractor’s yard. Asphalt concrete and Portland cement concrete rubble shall be removed immediately to an approved disposal site.
- *Sanitary/Septic Waste Management.* Portable toilets shall be located and maintained 50 feet away from drain inlets and away from paved areas.
- *Stockpile Management.* Stockpiles shall be surrounded by sediment controls and shall be covered. Alternatively, soil binders may be used to minimize erosion. If contaminated soils are encountered, such as soils containing aerially-deposited lead, stockpiles shall be covered and bermed and located away from storm drain inlets and watercourses, and on-site storage shall be minimized. Hazardous materials shall be transported and disposed in accordance with applicable regulations (refer to Mitigation Measure HAZ-1c).
- *Concrete Waste Management.* Cement-based fill material shall be used for the project and waste management shall be consistent with requirements in the CA BMP Handbook (BMP WM-8). Concrete washout waste will be contained and managed properly.
- *Training.* Construction site personnel shall receive training on implementing all BMPs included in the SWPPP. All personnel that inspect BMPs and perform other monitoring activities, such as visual observations and collecting water quality samples, shall be trained.

- *Post-Construction BMPs*. Outlet protection/energy dissipating devices, vegetative buffer strips, or sand filters shall be installed at culverts and along the roadway, where feasible. Exposed slopes shall be seeded with a mix native to Marin County that is appropriate for erosion control.

Mitigation Measure HYD-1b: As part of project implementation, the County shall implement the following ~~three~~ five water quality improvement measures:

1. The County shall install a permeable layer, as the top surface layer above impervious rubberized asphalt concrete on all paved road sections. Runoff exiting the permeable friction course shall be designed to sheetflow on the underlying impervious asphalt concrete and discharge into the nearest storm drain inlet, culvert, or directly over the outboard edge of the road.
2. Pullout areas shall be designed with permeable asphalt to allow stormwater to percolate through the asphalt and be collected in an under drain that will be routed to discharge at the nearest existing roadway culvert.
3. In locations where the road slopes toward Lagunitas Creek and there is adequate space, a vegetative buffer strip shall be established adjacent to the road. The buffer strip vegetation shall be indigenous to Marin County and shall also be suitable for erosion control. The buffer shall be protected from vehicle traffic and illicit parking by placement of a barrier (e.g., guardrail, boulders) between the road and the buffer.
4. In locations where the road slopes toward the hillside and away from Lagunitas Creek, a vegetated swale with permeable backfill underneath that would function like a sand filter shall be installed, where feasible. A perforated pipe shall be installed within the permeable backfill to direct infiltrating runoff to the nearest culvert; the underdrain shall reduce the ponding of water that inundates the road during significant storm events. The bioswale vegetation shall be indigenous to Marin County and shall also be suitable for erosion control. Swales/sand filters shall not be installed in locations of freshwater emergent wetlands (to preserve the wetlands).
5. The need for the water quality improvement measures to be designed for flow duration control shall be evaluated in the project design phase. Pre- and post-project flow duration curves shall be generated using a hydrologic model that analyzes a long-term time series of precipitation data to generate the cumulative frequency of in-stream flows of a certain magnitude for the full distribution of flows up to the pre-project 10-year peak flow rate. Flow duration control shall be implemented if pre- and post-project flow duration curves deviate by more than 10% over the length of the flow duration curve; subsurface storage shall be provided within the water quality treatment measures, and the outlet shall be designed to discharge the increase in runoff volume resulting from the project at a rate that does not increase in-stream erosion.

Significance After Implementation. Implementation of Mitigation Measures HYD-1a and HYD-1b would reduce construction- and operation-period impacts to water quality to a ***less-than-significant*** level.

4.7 HAZARDS AND HAZARDOUS MATERIALS

This section describes hazardous materials[153] and other hazards to public health and safety that could result from implementation of the proposed project. Information presented in this section is based on available reports and maps, and information derived from site visit conducted on October 6, 2009, to identify potential hazards in and around the project site.

4.7.1 Setting

This section summarizes the hazards and hazardous materials within the project area.

Hazardous Materials in Soils and Groundwater in the Project Vicinity. A review of listed hazardous material release sites compiled pursuant to Government Code Section 65962.5 (Cortese List) indicates that there are no sites with active investigations within or adjacent to the project. The Water Board's Geotracker database indicated that a leaking underground storage tank investigation occurred at the McIsaac Ranch (9490 Sir Francis Drake Boulevard), which is at the intersection of SFDB and Platform Bridge Road (the western project limit).[154] The contaminant of concern for the investigation was gasoline. The Water Board reported that the investigation was opened in 1991 and closed in March 2000.

The portion of SFDB within the project was constructed in 1929 as a two-lane arterial roadway, and the County of Marin has historically maintained the roadway. Due to the age of the roadway, the project could be impacted by aerially deposited lead (ADL). Alkyl lead compounds were first added to gasoline in the 1920s. Beginning in 1973, the EPA mandated a gradual phase-out of lead from gasoline that significantly reduced the prevalence of lead in gasoline by the mid-1980s.[155] Soils adjacent to freeways and heavily traveled roads have the potential to be affected by ADL due to historic automobile exhaust prior to the elimination of lead in gasoline. Lead has commonly been found within 30 feet of the edge of pavement and within the top six inches of soil;[156] however the lateral distance and depth of ADL vary from site to site.

From approximately 1875 to 1935, the North Pacific Coast Railroad and then later, the Northwestern Pacific Railroad operated trains from Sausalito to Point Reyes Station. Originally, the railroad was constructed to transport lumber and dairy products from Point Reyes and points north down to San Francisco.[157] In 1974, Marin County purchased the rail line from Lagunitas to Tocaloma and paved portions of the right-of-way for trail use.[158] Currently a paved bike trail adjacent to SFDB follows the old railroad right-of-way, although the railroad also traversed SFDB in some locations within the

[153] The California Health and Safety Code defines a hazardous material as "….any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety, or to the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, radioactive materials, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment." (Health and Safety Code, Section 25501).
[154] State Water Resources Control Board Geotracker Website geotracker.swrcb.ca.gov/, Accessed October 15, 2009.
[155] California Department of Toxic Substances Control (DTSC), 2004. *Draft Lead Report*, August.
[156] California Department of Toxic Substances Control (DTSC), 2009. *Caltrans Statewide Variance for Reuse of Lead-Contaminated Soils, Fact Sheet*, April.
[157] Rails to Trails Conservancy, Website: www.railstotrails.org/news/recurringfeatures/trailmonth/archives/0112.html, Accessed October 13, 2009.
[158] Ibid.

project. Pesticides and herbicides have historically been applied along railroad rights-of-way, and many historic pesticides, due to their chemical properties, may persist in soils for decades. In addition, chemically-treated railroad ties may contain creosote and metals. Residual pesticides and/or herbicides, creosote, and metals resulting from railroad activities may be present in the soils beneath (at railroad crossings) and/or adjacent to the project.

Naturally-Occurring Asbestos. Chrysotile and amphibole asbestos occur naturally in certain geologic settings in California, most commonly in association with ultramafic rocks and along faults.[159] Asbestos is a known carcinogen and inhalation of asbestos may result in the development of lung cancer or mesothelioma. Serpentine is common in Marin County and many other places and it contains naturally-occurring asbestos.[160] A map prepared by the California Department of Conservation Division of Mines and Geology (now known as the California Geological Survey) indicates that, based on regional mapping, naturally-occurring asbestos could exist within the project.[161] However, the geotechnical investigation report for the project indicates that the project has been mapped as being underlain by sandstone and shale, mélange, and greenstone.[162] Therefore, the project does not appear to contain naturally-occurring asbestos.

Sensitive Receptors. There are no existing or proposed schools located within ¼-mile of the project.[163] The Land Use Policy map shows that there are no residential uses that border the project,[164] although there are a small number of residences along the project located on State Park property.

Emergency Evacuation Routes. The project, because it is located on SFDB, could be used in the event of an emergency evacuation.

Wildland Fire Areas. Wildland fire hazard areas exist over approximately 85 percent of Marin County.[165] The fire season generally lasts from five to six months (the dry season). The wildland fire hazard is caused by a combination of factors including rugged terrain, highly flammable vegetation and forest, long summers, and human activity. The Marin County Fire Department classifies the project vicinity as a Moderate to High fire hazard.[166]

[159] California Geological Survey-Asbestos, Website: www.conservation.ca.gov/cgs/minerals/hazardous_minerals/asbestos/Pages/Index.aspx, Accessed October 13, 2009.
[160] Marin Municipal Water District, Water Quality and Breast Cancer – Frequently Asked Questions/Topics, Website: www.marinwater.org/controller?action=menuclick&id=239, Accessed October 13, 2009.
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[165] Marin County Sheriff's Office of Emergency Services, 2008. op. cit.
[166] Marin County Fire Department, 2007. Marin County Fire Hazard Severity Zone Map, December 18, 2007. Website: www.xmrfire.org/mrn/Public%20Documents/FHSZ-M-2.pdf, Accessed October 13, 2009.

4.7.2 Regulatory Framework

This section describes the regulatory framework for hazardous materials, hazardous waste, and other hazards (including wildland fires), and applicable worker health and safety requirements, including federal, state, and local laws and regulations pertaining to hazardous materials management and wildland fires.

Federal. The U.S. EPA is the lead agency responsible for enforcing federal laws and regulations pertaining to hazardous materials that affect public health and the environment. The major federal laws and regulations enforced by the U.S. EPA include the: Resource Conservation and Recovery Act (RCRA); Toxic Substances Control Act (TSCA); Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); and Superfund Amendments and Reauthorization Act (SARA).

In 1974, RCRA was enacted to provide a general framework for the U.S. EPA to regulate hazardous waste from waste generation to ultimate disposal. In accordance with RCRA, facilities that generate, treat, store, or dispose of hazardous waste are required to properly manage wastes from "cradle to grave."

In 1976, TSCA was enacted to provide the U.S. EPA authority to regulate the production, importation, use, and disposal of chemicals that pose a risk of adversely affecting public health and the environment, such as polychlorinated biphenyls (PCBs), asbestos-containing materials, and lead-based paint. TSCA also gives the U.S. EPA authority to regulate the cleanup of sites contaminated with specific chemicals, such as PCBs.

In 1980, CERCLA, commonly known as "Superfund," was enacted to ensure that a funding source would be available for the U.S. EPA to clean up uncontrolled or abandoned hazardous materials release sites that pose a risk of adversely affecting public health and the environment. Prohibitions and requirements regarding closed or abandoned hazardous waste sites and liability standards for responsible parties were also established by CERCLA. In 1986, SARA amended CERCLA to increase the Superfund budget, modify contaminated site cleanup criteria and schedules, and revise settlement procedures.

While the U.S. EPA regulates overall use and cleanup of hazardous materials, the U.S. Department of Transportation (DOT) is the federal administering agency responsible for hazardous materials transportation regulations. The DOT Office of Hazardous Materials Safety oversees a national safety program to minimize the risks related to commercial transportation of hazardous materials. The federal hazardous materials transportation law (49 USC 5101 et seq.) is the basic statute regulating hazardous materials transportation in the United States.

Vehicles transporting petroleum are required to prepare and implement a Response Plan that describes health and safety training, equipment testing, and response actions to prevent or mitigate a release of petroleum during transportation.[167] Motor carriers transporting hazardous materials are subject to package marking, labeling, and placarding requirements that identify the hazards associated with the materials being transported. Health and safety training and emergency response information must also be maintained by motor carriers transporting hazardous materials to prevent or mitigate a

[167] Code of Federal Regulations, Chapter 49, Part 130.

release of hazardous materials.[168] In California, the California Department of Transportation (Caltrans) is the implementing agency for DOT laws and regulations.

State. In California, the U.S. EPA has granted most enforcement authority of federal hazardous materials regulations to the California Environmental Protection Agency (Cal/EPA). Under the authority of Cal/EPA, the Department of Toxic Substances Control (DTSC) or the San Francisco Bay Regional Water Quality Control Board (Water Board) is responsible for overseeing the cleanup of contaminated sites in the vicinity of the project.

Cal/EPA has also granted responsibilities to local agencies, such the Marin County DPW, Waste Management Division, for implementation and enforcement of hazardous material regulations under the Unified Program.[169] The Unified Program is discussed, below, under local regulations.

Hazardous Materials Release Sites. Known or suspected contaminated sites under DTSC or Water Board oversight are identified by Cal/EPA pursuant to Government Code section 65962.5. The provisions of Government Code section 65962.5, which are commonly referred to as the Cortese List, require the DTSC, the Water Board, the Department of Health Services, and the California Integrated Waste Management Board to submit information pertaining to sites associated with solid waste disposal, hazardous waste disposal, and/or hazardous materials releases to the Secretary of Environmental Protection.

Worker Health and Safety. Worker health and safety are protected by federal and state laws and regulations. The Occupational Health and Safety Administration (OSHA) is the federal administering agency for worker health and safety regulations. The federal OSHA is responsible for enforcement and implementation of federal laws and regulations pertaining to worker health and safety. Under OSHA jurisdiction, the Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations[170] require training and medical supervision for workers at hazardous waste sites. Additional regulations have been developed for construction workers regarding exposure to lead[171] and asbestos[172] during construction activities.

The California Department of Industrial Relations, Division of Occupational Safety and Health (DOSH), enforces state regulations and supervision of work places in California that are not under direct federal jurisdiction. State worker health and safety regulations applicable to construction workers include training requirements for hazardous waste operations and emergency responses,[173] and lead[174] and asbestos[175] regulations that equal or exceed their federal counterparts.

Wildland Fire Hazards. State policies regarding wildland fire safety are administered by the Office of the State Fire Marshal and the California Department of Forestry and Fire Protection (CDF). Marin County's primary fire protection is provided by the Marin County Fire Department, which also serves as a CDF contract agency.

[168] Code of Federal Regulations, Chapter 49, Part 172.
[169] California Health and Safety Code, Chapter 6.11, Sections 25404-25404.8.
[170] Code of Federal Regulations, Chapter 29, Section 1210.120.
[171] Code of Federal Regulations, Chapter 29, Section 1926.62.
[172] Code of Federal Regulations, Chapter 29, Section 1926.1101.
[173] California Code of Regulations, Chapter 8, Section 5192.
[174] California Code of Regulations, Chapter 8, Section 1532.1.
[175] California Code of Regulations, Chapter 8, Section 1529.

Construction contractors are required to comply with the following requirements in the California Public Resource Code (PRC) during construction activities at any sites with forest, brush, or grass-covered land:

- Earthmoving and portable equipment with internal combustion engines must be equipped with a spark arrestor to reduce the potential for igniting a wildland fire (PRC Section 4442).
- Appropriate fire suppression equipment must be maintained during the highest fire danger period – from April 1 to December 1 (PRC Section 4428).
- On days when a burning permit is required, flammable materials must be removed to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor must maintain the appropriate fire suppression equipment (PRC Section 4427).
- On days when a burning permit is required, portable tools powered by gasoline-fueled internal combustion engines must not be used within 25 feet of any flammable materials (PRC Section 4431).

Local. The following local regulations pertain to hazards and hazardous materials in and around the project site.

Certified Unified Program Agency. The Marin Municipal Code established the Marin County Department of Public Works, Waste Management Division as the Certified Unified Program Agency (CUPA) in Marin County. CUPA responsibilities and requirements are codified in the Marin County Municipal Code Title 7 (Health and Sanitation), Chapters 7.80-7.83. As the CUPA, the Marin County Department of Public Works, Waste Management Division has responsibility for implementing all the unified programs within its jurisdiction. Unified programs regulate: the preparation of hazardous materials business plans, hazardous waste generators, hazardous waste onsite treatment, underground storage tanks, and aboveground storage tanks. Emergency response, as coordinated with the State Office of Emergency Services, is also included under the CUPA.

The Hazardous Materials Area Plan (Area Plan) describes the County's pre-incident planning and preparedness for hazardous materials releases.[176] The Area Plan clarifies the roles and responsibilities of federal, state, and local agencies during a hazardous materials incident. It also describes the County's hazardous materials incident response program, training, communications, and post-incident recovery procedures.

Marin County Sheriff's Office of Emergency Services**.** Sheriff's Office of Emergency Services (OES) coordinates emergency operations activities among all the various local jurisdictions and develops written guidelines for emergency preparedness, response, recovery, and mitigation to natural or man-made disasters. The OES serves as the liaison between the state and all the local government political subdivisions comprising Marin County. The OES has established a fully functional Emergency Operations Center from which centralized emergency management can be performed. The OES also maintains the Operational Area Emergency Operations Plan (EOP).[177] The EOP is the primary emergency planning and management document for the County and Operational Area (cities/towns, special districts, and unincorporated areas within the County), and it describes strategies for

[176] Marin County Department of Public Works, Waste Management Division, 2008. *County of Marin Hazardous Materials Area Plan*, July.
[177] Marin County Sheriff's Office of Emergency Services, 2008. *Marin Operational Area Emergency Operations Plan*, July.

sustaining and building on existing mitigation activities to ensure the future and safety of lives, preservation of property, and protection of the environment during a disaster. The EOP would be activated for a hazardous materials incident when additional resources or extended response activities are needed.

The OES has also prepared the Marin County Operational Area Hazard Mitigation Plan.[178] The purpose of the plan is to meet the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-3900) and thereby maintain continued eligibility for certain hazard mitigation or disaster loss reduction programs from the Federal Emergency Management Agency.

Marin Countywide Plan. The Environmental Hazards and Public Safety elements of the Marin Countywide Plan contain the following policies related to hazards and hazardous materials.[179]

Policy EH-1.3: Identify Evacuation Routes. Provide the public with information on evacuation routes for fire, geologic, and other hazards.

Policy EH-4.3: Adopt and Implement a Fire Management Plan. Develop a proactive approach to manage wildfire losses by identifying hazard risks and enacting effective mitigation strategies.

Policy PS-4.: Regulate and Reduce Hazardous Material Use. Control the use and storage of hazardous materials to minimize their presence in, and potential dangers to, the community and environment.

4.7.3 Significance Criteria

A significant hazardous materials impact would occur if the project would:

- Create a significant hazard to the public or the environment as a result of routine transport, use, or disposal of hazardous materials.
- Create a significant hazard to the public or the environment through reasonably foreseeable upset or accident conditions involving the release of hazardous materials into the environment.
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼-mile of an existing or proposed school.
- Be located on or adjacent to a site that is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would result in a safety hazard for people residing or working in the area.
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public 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.

[178] Marin County Sheriff's Office of Emergency Services, 2006. *Marin County Operational Area Hazard Mitigation Plan*, April.
[179] Marin County Community Development Agency, 2007. *Marin Countywide Plan*, November 6.

- Impair the implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

4.7.4 Impacts and Mitigation Measures

The following section presents a discussion of the impacts related to hazards and hazardous materials that could result from implementation of the proposed project. Impacts are organized by less-than-significant impacts and significant impacts, based on the thresholds.

(1) Emission of Hazardous Materials within ¼ mile of an Existing or Proposed School. There are no existing or proposed schools located within ¼-mile of the project. Therefore, implementation of the project would have no impact related to handling or emitting hazardous materials near schools.

(2) Included on a List of Hazardous Materials Sites. There are no sites in the project vicinity that are identified on the Cortese List (Government Code Section 65962.5), except for a leaking underground storage tank investigation (for gasoline) that was closed by the Water Baord in 2000. Therefore, there is little or no potential for releases from hazardous waste and substance sites, leaking underground storage tank sites, solid waste disposal sites with constituents above hazardous waste levels, or sites with Cease and Desist or Cleanup and Abatement Orders, under the jurisdiction of the DTSC or Water Board, to create a significant hazard to the public or environment.

(3) Within the Vicinity of a Public or Private Airstrip. The project is not located within an airport land use plan, and the nearest public airport, the Marin County Airport at Gnoss Field in Novato, is located approximately 12 miles from the project. The nearest private airport, the Commodore Center Seaplane Base in Sausalito, is located approximately 18 miles from the project. Therefore, the project would not result in airport operations-related safety hazard for people residing or working in the project area.

(4) Emergency Response or Evacuation Plan. Implementation of the project would not be expected to interfere with the County's emergency response or evacuation plans. The only planned evacuation routes identified in the Marin County Emergency Operations Plan or Hazard Mitigation Plan are for tsunamis, and the project would not encroach upon tsunami evacuation routes.[180,181] In the construction phase, implementation of the project would entail partial lane closures along a portion of SFDB, but the project would not preclude the use of SFDB for evacuation in an emergency, and the impacts would therefore be less than significant. The operational phase of the project would not interfere with the use of SFDB for emergency response or as an evacuation route (although it is not a designated evaluation route), and would improve road conditions, which would facilitate an evacuation.

(5) Wildland Fires. The Marin County Fire Department classifies the project as having a Moderate to High fire hazard. Because the project traverses forested land, construction contractors are

[180] Marin County Sheriff's Office of Emergency Services, 2008. op. cit.
[181] Marin County Sheriff's Office of Emergency Services, 2006. op. cit.

required to comply with fire prevention measures for forest-covered land identified in PRC Sections 4428-4442. Compliance with the existing fire prevention regulations would reduce the risk of increasing wildland fires to a less-than-significant level.

Impact HAZ-1: Project construction activities would entail the use of hazardous materials and could also encounter hazardous materials in shallow soils, which would require transportation off site and disposal. In addition, hazardous materials used or encountered during construction could create a significant hazard through release into the environment. (S)

Road construction activities would include the use of hazardous materials such as fuels, oils, lubricants, asphalt products, other petroleum products, and solvents. In addition, shallow soils that would be disturbed during project construction beneath or adjacent to SFDB could be affected by ADL, which would require off-site transport and disposal. The ADL could potentially pose a health risk to construction workers and may require special soil management during construction. Moreover, project construction activities may encounter residual hazardous chemicals associated with historic Northwestern Pacific Railroad activities, which could be released into the environment and would require off site transport and disposal. Direct contact, inhalation, or ingestion of hazardous chemicals could cause adverse health effects; the severity of health effects would depend on the contaminant(s), concentration, use of personal protective equipment during construction, and duration of exposure. The release of hazardous materials during road construction activities could pose a hazard to construction workers, nearby receptors, and the environment.

Mitigation Measure HAZ-1a: Prior to the initiation of project construction, a soil investigation shall be performed by a licensed professional to evaluate if ADL and other potentially hazardous constituents are present in shallow soils that would be disturbed. Chemical analyses for soil shall be performed by an analytical laboratory certified by the California Department of Public Health Environmental Laboratory Accreditation Program. A licensed professional shall review the results of the soil investigation and provide recommendations on additional investigation activities, if any, and soil management requirements during project construction, if applicable (see Mitigation Measure HAZ-1c). The analytical results of the soil investigation shall be compared to hazardous waste criteria and health and safety thresholds for construction workers. The soil investigation shall be conducted with oversight from a local or state regulatory agency.

Mitigation Measure HAZ-1b: Prior to the initiation of project construction, a project-specific HASP shall be prepared by a certified industrial hygienist that shall include measures to protect construction workers and the general public, if contaminants are identified during the soil sampling recommended in Mitigation Measure HAZ-1a. Such measures shall include monitoring, engineering controls, administrative controls, and security measures to prevent unauthorized entry into the construction area. If prescribed exposure levels for contaminants (see Mitigation Measure HAZ-1a) are exceeded, personal protective equipment shall be required for workers in accordance with state and federal regulations. The HASP shall address the possibility of encountering unknown contamination or subsurface hazards, in addition to emergency response procedures in the event of a hazardous materials release. The project sponsor shall verify that the HASP is incorporated into the construction worker's health and safety programs.

Mitigation Measure HAZ-1c: If warranted, based on the results of the pre-construction soil characterization (Mitigation Measure HAZ-1a), the County shall implement a Risk Management Plan (RMP) that will identify special soil management and disposal procedures and/or construction worker health and safety procedures (in addition to the HASP) to be implemented during project construction to reduce exposure to hazardous materials. The RMP shall include all necessary procedures to ensure that excavated soils are stored, tested, managed, and disposed of in a manner that is protective of human health and in accordance with applicable laws and regulations. The County shall ensure that the RMP includes available data from any pre-project construction soil sampling activities (Mitigation Measure HAZ-1a). The County shall provide the RMP to construction contractors and ensure that contractors are following the RMP. The RMP shall consider the following requirements:

- Excavation, transportation, and placement operations shall result in no visible dust.
- A construction "Exclusion Zone" shall be identified where hazardous materials may be stored. A temporary security fence shall be installed to surround and secure the exclusion zone.
- Air quality shall be monitored during excavation of soils contaminated with hazardous constituents.
- Storage of hazardous materials shall comply with the requirements in Title 22, CCR, Sections 6626.250 to 66265.260.
- If temporary stockpiling of hazardous materials is necessary, the construction contractor shall:
    - Cover the stockpile with plastic sheeting or tarps.
    - Install a berm around the stockpile to prevent runoff from leaving the area.
    - Locate the stockpile away from storm drain inlets and Lagunitas Creek.
- Hazardous materials shall be excavated, transported, and disposed in accordance with the rules and regulations of the following agencies:
    - United States Department of Transportation (DOT).
    - United States Environmental Protection Agency (EPA).
    - California Environmental Protection Agency (Cal/EPA).
    - California Division of Occupational Safety and Health (DOSH).
    - Local regulatory agencies.

Mitigation Measure HAZ-1d: The Storm Water Pollution Prevention Plan required as Mitigation Measure HYD-1a shall include Best Management Practices (BMPs) for containing hazardous materials and minimizing the contact of hazardous materials (e.g., fuels, lubricants, paints, solvents, and adhesives) with rain and stormwater runoff, including BMPs for stockpile management.

Significance After Implementation. Implementation of Mitigation Measures HAZ- 1a through HAZ-1d would reduce the impacts of hazardous material transport, disposal and releases of the project to ***less-than-significant***.

4.8 TRAFFIC AND CIRCULATION

This section describes the existing transportation system in the project area and identifies potential traffic impacts, including impacts from construction. Since the proposed project is the rehabilitation of a segment of SFDB, there would be few, if any, long-term adverse effects. Therefore, the impact analysis is focused primarily on those potential impacts related to construction of the project. The purpose of the project is to improve roadway safety within the project segment by rehabilitating deteriorated pavement. No capacity enhancements or major design modifications are proposed.

4.8.1 Setting

Circulation System. SFDB is a key east-west arterial that connects eastern (urban) Marin County (County) at the Richmond-San Rafael Bridge to western (rural) County and the Point Reyes Lighthouse at the Pacific Ocean. The road intersects with Red Hill Avenue in San Anselmo and travels west through the town of Fairfax and the communities of Woodacre, Forest Knolls, Lagunitas, and Inverness Park before the final stretch past Drakes Estero to the ocean.

As noted in the Project Description (Section 3.0), the proposed project is the rehabilitation of a 5.2 mi length of SFDB between Shafter Bridge and Platform Bridge Road. This portion of SFDB provides vehicular connections with State Route 1 (SR-1) -Shoreline Highway/Bear Valley Road to the west and Platform Bridge Road/Point Reyes-Petaluma Road and Nicasio Valley Road to the north. SFDB also provides connections with Fairfax-Bolinas Road to the south and 4th Street/Red Hill Avenue through the City of San Rafael to the east (see Figures 3.1-1 and 3.1-2). Following is a description of the main roadways in the project vicinity.

- **SR-1 (Shoreline Highway)** is a two-lane highway that runs generally north to south in West County, with the exception of its access point from United States 101 (US 101) at Tamalpais Valley. SR-1 follows the east side of the Golden Gate National Recreation Area and the entire recreational corridor of West County for the duration of its length through the County. There is relatively little development along SR-1 in the west. Shoreline Highway is primarily used for intercommunity travel within West Marin or by visitors to the State and Federal parks and the County. The 2007 Marin Congestion Management Program (CMP) reports that SR-1 operates at an acceptable level of service (LOS).
- **SFDB** is designated a Principal Arterial in the CMP between US 101 and SR-1. SFDB serves as a main route to and from many communities west of US 101 in the County, including Greenbrae, Kentfield, Ross, San Anselmo, Fairfax, and the communities in West Marin. East of US 101, the road widens to six lanes approaching Larkspur Landing. The portion of SFDB that traverses the communities west of US 101 and the Town of Fairfax is primarily a four-lane road with the exception of that portion that passes through the Town of Ross. West of Fairfax, the roadway narrows to two lanes; west of SR-1, it curves north along the southern portion of Tomales Bay and then turns southwest toward the Point Reyes Peninsula.

  No official or designated parking areas are located within the project area due to the extremely narrow shoulders along a majority of the roadway route. There are numerous unpaved areas along SFDB that are used by vehicles to pull off of the roadway. Many of the existing pullouts are too small to safely accommodate a vehicle. The proposed project would remove these “unofficial” pullouts and provide paved pullouts to increase safety along SFDB.

- **Lucas Valley Road** is another east-west arterial that connects the urbanized portions of the County with its agricultural interior and the communities in the west. Lucas Valley Road runs from US 101 in the eastern portion of the County to Nicasio Valley Road. For most of its length, Lucas Valley Road is within unincorporated areas of the County, with the exception of the approximately 2 miles closest to US 101, which form the northern border of the City of San Rafael.

The road segment affected by the proposed project connects to the following local roadways.

- **Platform Bridge Road** is a two-lane rural roadway that connects SFDB with Point Reyes-Petaluma Road, which then travels west to SR-1 and east to Petaluma and Novato.
- **Point Reyes-Petaluma Road** is a two-lane rural roadway that connects SR-1 with the City of Petaluma.
- **Bear Valley Road** travels parallel to SR-1 between Point Reyes National Seashore and Golden Gate National Recreation Area.
- **Nicasio Valley Road** is two-lane rural roadway that connects SFDB with Point-Reyes-Petaluma Road through the town of Nicasio and to Lucas Valley Road east through Lucas Valley to US 101.
- **Fairfax-Bolinas Road** is a winding two-lane rural roadway that connects the Town of Fairfax to SR-1, the community of Bolinas, and the Pacific Ocean to the southwest.
- **San Geronimo Valley Drive** is a two-lane roadway generally parallel to and south of SFDB within the community of San Geronimo.

Bicycle and Pedestrian System. Caltrans defines three categories of bikeways.

- **Class I Bikeway:** Called a bike path or multiuse trail. Provides for bicycle travel on a paved right-of-way completely separated from any street or highway.
- **Class II Bikeway:** Referred to as a bike lane. Provides a striped lane for one-way travel on a street or highway.
- **Class III Bikeway:** Referred to as a bike route. Provides for shared use with pedestrian or motor vehicle traffic and is identified only by signing.

The Sir Francis Drake Bikeway is a Class I bikeway that travels parallel to SFDB for approximately eight miles between Platform Bridge Road and Lagunitas. The West Marin County Proposed Bikeway Network includes the Sir Francis Drake Bikeway Study Area, where a Class III bike route is proposed on SFDB from Lagunitas to Olema, within the same boundaries as the project. The March 2008 Marin County Unincorporated Area Bicycle and Pedestrian Master Plan notes that bicycle travel is difficult along SFDB and other two-lane winding roads because of variations in pavement width.

Transit System. Public transportation within the proposed project area includes the West Marin Stagecoach (Stagecoach) transit service provided by Marin County Transit District (MCTD). Buses use the roadway segment that is proposed to be rehabilitated in this project. Stagecoach Route 68 provides service between San Rafael and Inverness via SFDB; with a bus stop at the campgrounds in Samuel P. Taylor Park, at mile marker 17.10. Eastbound service to San Rafael is provided between

6:30 a.m. and 6:11 p.m., and westbound service to Inverness is provided between 8:05 a.m. and 7:53 p.m. The eastbound and westbound stops are located at "Camp Taylor."

Existing Traffic Volumes. National Data and Surveying Services completed traffic counts at Shafter Bridge from Thursday, October 23, 2008, to Wednesday October 29, 2008, and at Platform Bridge from Tuesday, November 4, 2008, to Monday, November 10, 2008. Count results revealed that the highest average daily traffic (ADT) volumes were on the weekend. The higher weekend day counts are likely due to recreational traffic. Table 4.8.A displays the average traffic from the five weekday days and two weekend days surveyed at each endpoint.

Table 4.8.A: Sir Francis Drake Boulevard Existing Traffic Volume

	Weekday			Weekend	
	ADT	AM Peak Hour	PM Peak Hour	ADT	Peak Hour
Shafter Bridge					
Westbound	996	73	84	1,819	272
Eastbound	977	53	112	2,083	318
Total	1,973	126	196	3,902	590
Platform Bridge					
Westbound	1,197	101	88	1,569	209
Eastbound	1,133	59	155	1,688	249
Total	2,330	160	243	3,257	458

ADT = Average Daily Traffic
AM Peak Hour = The highest one-hour volume between 7:00 a.m. and 9:00 a.m.
PM Peak Hour = The highest one-hour volume between 4:00 p.m. and 6:00 p.m.
Source: National Data and Surveying Services, 2008

Traffic volumes measured in the field at the endpoints of the proposed project are far less than the volumes reported on Figure 3-36 in the Marin Countywide Plan, which indicated a one-way peak-hour volume of 910 vehicles. The Marin Countywide Plan, however, does not analyze the project segment in detail. Instead it is included in a much larger segment, "Sir Francis Drake Blvd., from Butterfield Rd. to SR-1." Butterfield Road is located in the urban County, several miles east of the project segment. Significantly lower volumes on the project segment are not a surprising discovery given the remoteness of the location.

Both the Marin CMP and the Marin Countywide Plan indicate that the segment of SFDB between Butterfield Road and SR-1 historically has an unacceptable LOS. This segment is over 15 miles long and spans the eastern (urban) County and western (rural) County. It is reasonable to believe that the historically unacceptable LOS occurred in the eastern portions of the segment, given recent counts in the western portion of the segment indicating much lower volumes.

Existing Roadway Capacity. The number of vehicles that can be served by a segment of roadway is dependent on a number of factors. These factors include terrain, lane widths, shoulder widths, design speed, and the number of trucks and recreational vehicles (RVs) served by the roadway. According to the Marin Countywide Plan, the segment of SFDB between Butterfield Road and SR-1 has a one-way capacity of 960 vehicles per hour (vph). By comparison, a travel lane in standard conditions (i.e.,

level terrain, 12-foot [ft] lane widths, no horizontal curves) is assumed to have a capacity of approximately 1,600 to 1,700 vph.

4.8.2 Regulatory Framework

County of Marin Department of Public Works. While SFDB runs through areas under the jurisdiction of the GGNRA and State Parks system (Samuel P. Taylor), maintenance of the road falls to the County. As the road was constructed in 1929, the Marin County DPW proposes to rehabilitate the 5.2 mile segment and improve limited turnouts and shoulders as well as the drainage system to ensure that the roadway would last for an additional 30 years.

Marin Countywide Plan. Policy TR-1.2 and Implementation Plan TR-1.e of the existing Marin Countywide Plan establishes LOS D or better as the goal for vehicles on streets and highways and performance standards for transit, bicycles, pedestrians, and other modes of transportation.

Policy TR-1.6 and Implementation Plan TR-1.o recommend maintaining roads in West Marin as two-lane routes that keep the area rural. The policies permit shoulder widening for bicycles, turnouts for slow-moving traffic, and similar improvements.

Marin County Unincorporated Area Bicycle and Pedestrian Master Plan. Goals 1 and 2 of the Marin County Unincorporated Area Bicycle and Pedestrian Master Plan (adopted June 2008) support improvements to bicycle and pedestrian facilities to make bicycling and walking safer and more convenient. The updated plan was completed for the unincorporated area for the Marin County DPW in 2006–2008 as a part of a countywide effort to update all local bicycle master plans. On streets with low traffic volumes and speeds (under 5,000 vehicles per day, 30 miles per hour [mph]), such as the project segment of SFDB, bike lanes may not be needed at all. Bicycle lanes on low-volume, low-speed roadways may not be warranted due to terrain challenges and potential impacts on environmental resources, including visual resources. As noted in the West Marin County Existing Bikeway Network figure from the Master Plan, there are disconnected bicycle facilities along SFDB. The plan states that bicycling and pedestrian access could be improved on such roads by adding signing, shoulder widening, or new shoulders; restriping the travel lane; providing new or improved turnouts; and/or enhancing roadway surfacing.

Samuel P. Taylor Bike Path/East-West Bikeway Project. The East-West Bikeway was first identified in the Cross Marin proposal in the 1970s. Similar to the North-South Bikeway, this bikeway would generally follow the alignment of the old Northwestern Pacific (NWP) right-of-way from Inverness through Samuel P. Taylor State Park, Lagunitas, San Geronimo, Woodacre, Fairfax, and San Anselmo. The segment of the former NWP narrow gauge line between Woodacre and Point Reyes Station followed the course of Lagunitas and Papermill Creeks, creating an ideal location for a multiuse path when it was abandoned. Part of this right-of-way is already in use as a paved trail between Tocaloma and Samuel P. Taylor State Park, offering an important safety amenity to pedestrians and bicyclists moving through this corridor. It also offers a direct safety benefit to motor vehicles by removing a large number of bikes that need to share the narrow, twisting roadway[182]. In 2005, the Inkwells Bridge was completed, fulfilling the first of the recommendations for this project

[182] Marin County 2008

identified in the 2001 County Bicycle Plan. Bikeway improvements are not part of the proposed project because funding is limited to roadway rehabilitation.

Marin County Fire Department. The Marin County Fire Department (MCFD) provides life and property protection services through an aggressive fire control system, an integrated pre-hospital care system, fire prevention, public education, and emergency management. Maximum road and driveway grades, widths, turning radii, turnout, and turnaround requirements are established by the MCFD since grades and other roadway conditions are most critical for heavy fire equipment.

California Department of Transportation. Caltrans operates and maintains US 101 and SR-1 (Shoreline Highway). Caltrans guidelines generally require that a traffic study be conducted for all projects that generate 50 or more peak-hour trips and include analysis of all intersections where the project would add at least 50 trips. A traffic study was not conducted for the proposed project, as all new traffic is expected to be short term during project construction. No significant increase in weekday or weekend traffic is expected after the roadway is rehabilitated because the roadway itself does not generate traffic trips, and proposed improvements would not increase the design speed of the existing roadway.

Transportation Authority of Marin. The Transportation Authority of Marin (TAM) is designated as both the Congestion Management Agency (CMA) and the transportation sales tax authority for the County. As the CMA, TAM addresses Marin's unique transportation issues, fulfilling the legislative requirements of Propositions 111 and 116, approved in June 1990. TAM was designated the sales tax authority in 2004 for the purpose of administering the 0.5-cent transportation sales tax in the County, passed by voters in November 2004 as Measure A. The proposed project would be funded by Measure A and is being jointly sponsored by TAM and the County of Marin Department of Public Works.

The TAM is responsible for managing a variety of transportation projects and programs in the County, working closely with all 11 cities and towns as well as the County.

4.8.3 Significance Criteria

The project would not increase capacity on SFDB and would therefore not result in permanent increased traffic. The impacts of the project have been evaluated based on the addition of the volume of construction-related traffic to existing conditions.

The 2007 Marin CMP establishes LOS D as the minimum standard for urban and suburban arterial roadways. This criterion is reiterated by Marin Countywide Plan Policy TR-1.e. The Marin Countywide Plan also establishes the use of volume-to-capacity (v/c) analysis to determine a roadways LOS. Table 4.8.B lists the descriptions of roadway v/c ratios and LOS.

Table 4.8.B: Roadway Segment Level of Service Definitions

LOS	V/C (Arterials)	Description
A	0.00–0.60	Conditions of free flow. Speed is controlled by drivers' desires, speed limits, or physical roadway conditions, not other vehicles.
B	0.61–0.70	Conditions of stable flow. Operating speeds beginning to be restricted, but little or no restrictions on maneuverability.

LOS	V/C (Arterials)	Description
C	0.71–0.80	Conditions of stable flow. Speeds and maneuverability somewhat restricted. Occasional back-ups behind left-turning vehicles at intersections.
D	0.81–0.90	Conditions approach unstable flow. Tolerable speeds can be maintained, but temporary restrictions may cause extensive delays. Speeds may decline to as low as 40% of free flow speeds. Little freedom to maneuver; comfort and convenience low.
E	0.91–1.00	Unstable flow with stoppages of momentary duration. Average travel speeds decline to one-third the free flow speeds or lower, and traffic volumes approach capacity. Maneuverability severely limited.
F	>1.00	Forced flow conditions. Stoppages for long periods, and low operating speeds (stop-and-go). Traffic volumes essentially at capacity over the entire hour.

Source: Marin Countywide Plan.

The proposed project is more likely to affect transportation facilities during construction rather than after roadway rehabilitation. The proposed project would not generate additional traffic trips, and there would typically be only a minimal amount of surface activity to maintain the roadway segment after construction is complete.

The following standards of significance are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For the purposes of this EIR, an impact to transportation/traffic would be considered significant if the proposed project would:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections).
- Exceed, either individually or cumulatively, an LOS standard established by the county congestion management agency for designated roads or highways.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.
- Result in inadequate parking capacity.
- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994) and the Marin County Congestion Management Program, the project may have a significant impact related to transportation and circulation if:

- Project traffic would significantly affect intersection LOS, resulting in an unacceptable service level (e.g., below LOS D).
- The project would not have adequate parking and internal circulation capacity to accommodate projected traffic so that offsite areas are not adversely affected.

- The project would not include provisions for pedestrian and bicycle circulation and bicycle and motorcycle parking and security.
- The project would generate more than 100 weekday PM peak hour trips.

4.8.4 Impacts and Mitigation Measures

This section identifies the potential significant traffic and circulation impacts associated with the proposed Sir Francis Drake Boulevard Rehabilitation Project. Mitigation measures are recommended, as appropriate, for significant impacts to reduce them to less-than-significant level. This section also identifies impacts that are considered to be less than significant.

Project Trip Generation. Construction trip generation projections (Table 4.8.C) were estimated based on the number and type of vehicles required for the various phases of activity during project construction. The project sponsor proposes that all construction occur during weekdays between the hours of 7:00 a.m. to 6:00 p.m. Staging necessary to complete the project may include the following phases over approximately 183 construction workdays:

- Stage 1: Saw cut along the centerline of the roadway.
- Stage 2: Crews grind asphalt from the existing concrete slab.
- Stage 3: Crews remove and replace culverts along the roadway. Crews repair slope at Station 270+25.
- Stage 4: Crews work in a westerly direction for the pavement cracking, compacting, or grinding operation. Tree removal, retaining wall construction and bioswale development to be completed along the north side of SFDB as needed.
- Stage 5: Crews work in an easterly direction for the pavement cracking, compacting, or grinding operation. Tree removal, retaining wall construction and bioswale development to be completed along the south side of SFDB as needed
- Stage 6: Final asphalt lift applied in a westerly direction from Shafter Bridge.
- Stage 7: Final asphalt lift applied in an easterly direction from Platform Bridge Road.
- Stage 8: Signing and striping within project area.

Table 4.8.C: Weekday Trip Generation from Construction

Type of Vehicle	Construction Stage	Total Trucks	Trips Per Day[1]
Earth/Debris truck	Stages 2, 3, 4, and 5 (129 days)	928 trucks	14
Water truck	Stages 3, 4, and 5 (124 days)	277 trucks from Olema or Point Reyes	4
Aggregate truck	Stages 3, 4, and 5 (124 days)	331 trucks from San Rafael	5
Asphalt truck	Stages 4, 5, 6 and 7 (152 days)	676 trucks from San Rafael	9
Miscellaneous (includes workers)	Stages 1 through 8 (183 days)	238 vehicles	3
		Total	**35 Trips/Day**

Source: Marin County Public Works Department and BKF Engineering.

[1] Each truck will generate one inbound and one outbound trip per day.

As shown in Table 4.8.C, during the peak construction stages (stages 3, 4, and 5), the proposed project would be expected to generate approximately 35 daily trips (i.e., 18 trips inbound and 18 trips outbound).

The number of non-construction vehicle trips on the roadway during and after construction are not expected to change from the existing condition as a result of the project. It is expected that approximately the same number of vehicles would utilize this road segment as in the current condition. Larger vehicles will continue to use SFDB in the future, as the Marin Countywide Plan designates this road as a main arterial.

Construction activities would require the use of compactors, backhoe loaders, and other heavy construction equipment. It is expected that the rehabilitation work would take approximately 183 construction days. Access on SFDB could be restricted to one-way traffic controlled by flagging personnel during paving operations. Table 4.8.D shows the type and number of equipment and personnel that would be required for the road and drainage construction activities.

Project Trip Distribution. Project construction traffic would use and be concentrated along SFDB with some traffic (approximately 10 percent) routed to the Redwood Landfill north of the City of Novato during debris removal activities (east on SFDB). Water trucks used during construction would obtain loads of water through a private source either in Olema or Point Reyes Station (west on SFDB). Trucks would haul rubberized asphalt from Dutra Materials in San Rafael along SFDB between San Rafael and the project site (east on SFDB). Miscellaneous trips in smaller trucks and autos (workers) would come from elsewhere in Marin and Sonoma Counties and possibly other locations in the San Francisco Bay Area (east on SFDB). Most of the debris (crushed asphalt) would be processed by an on-site crushing plant and reused as base material for the roadway at the project site.

As a result, the project would add 2 inbound and 2 outbound trips to the west per weekday and 16 inbound and 16 outbound trips to the east per weekday for the first 130 days. During the last 53 days, the project would add no trips to the west and 16 inbound and 16 outbound trips per weekday to the east. All trips added by the project are temporary and would cease when construction is complete.

Table 4.8.D: Construction Equipment and Personnel

Equipment Type	Number of Vehicles
Asphalt milling machine	1
Concrete breaker/rubilizer	1
Concrete saw	1
Smooth drum compactor	1
Soil compactor	1
Front end loader	1
Back hoe loader	2
Track excavator	1
Asphalt paver	2
Asphalt roller	3
Portable crushing plant	1
Trucks to haul spoils from site	4
Asphalt truck	4

Equipment Type	Number of Vehicles
Water truck	2
Miscellaneous support vehicles	6
Personnel	**Number**
Superintendent	1
Foreman	1
Equipment operators	4
Laborer	8

Source: Marin County DPW and BKF Engineers.

Level of Service Analysis. Construction trips generated by the project were added to existing traffic volumes previously displayed on Table 4.8.A. Those volumes were compared to the capacity of 960 vehicles per hour utilized for the roadway in the Marin Countywide Plan. The resulting volume to capacity (v/c) ratio was then assigned a LOS based on criteria displayed in Table 4.8.B. Table 4.8.E shows the existing and existing plus construction traffic conditions along SFDB.

Table 4.8.E: Level of Service Analysis

Traffic At:	Existing PM Peak Hour			Existing plus Construction Traffic		
	Volume	V/C	LOS	Volume	V/C	LOS
Shafter Bridge (EB)	112	0.12	A	128	0.13	A
Shafter Bridge (WB)	84	0.09	A	100	0.10	A
Platform Bridge (EB)	155	0.16	A	157	0.16	A
Platform Bridge (WB)	88	0.09	A	90	0.09	A
East of Butterfield Rd. (EB) [1]	910	0.95	E	926	0.96	E

[1] Source: Marin Countywide Plan Figure 3-36. No westbound volume provided.
EB = eastbound
LOS = level of service
v/c = volume-to-capacity
WB = westbound

As shown in Table 4.8.E, the effect on the roadway segment v/c ratio caused by construction activity would not be measureable on most segments, and would be minimal in the more congested areas east of the project area. Therefore the project construction would result in a less than significant impact.

Option A Trips. In addition to the general impacts described above for the road and drainage construction activities, Option A would result in a modified road configuration that requires up to 9 trees to be removed. The purpose of Option A would be to provide additional shoulder area, a more uniform width, and increased sight distance along a limited segment of the project area. With removal of the 9 trees identified in the conceptual project plans, a varying shoulder width between 0.5 and 2.0 ft would be provided.

Whether or not the trees are removed from along the roadway, the rehabilitation project would not increase roadway capacity and therefore would not generate new trips. The most intensive daily construction traffic is generated in the stages 3, 4, and 5. Additional trips related to Option A tree removal would not exceed that number of trips and therefore, mitigation measures appropriate for the rehabilitation project would also be appropriate for Option A.

(1) Cause a Substantial Increase in Traffic. Project-related construction activities would result in temporary increases in vehicle trips from construction activities on SFDB and other local

roadways. During the busiest stages of construction, 32 trips per day (or approximately 2 trips per hour in each direction) will be added to the congested eastern portion of SFDB. As shown in Table 4.8-5, this additional volume would not affect LOS. Therefore, this impact is considered less than significant.

(2) Exceed Roadway LOS Standard. According to the Marin Countywide Plan Built Environment Element Transportation Section LOS analysis, under existing conditions, the roadway segments monitored during the weekday p.m. peak hour along SFDB from Butterfield to SR-1 and from San Anselmo Avenue to Red Hill Avenue now operate at a grandfathered acceptable LOS E. Construction activities would create an additional 16 trips in each direction per day during the majority of project work (first 130 days). No work would be performed on weekends, when traffic volumes are greater. Construction activities are not expected to exceed 9 months, or approximately 183 weekday working days. The added trips during construction would be nominal and would only occur for the 9 months of construction activity, therefore the impact is considered less than significant.

(3) Result in a Change in Air Traffic Patterns. The proposed project would not have any impact on air traffic patterns.

(4) Result in Inadequate Parking Capacity. Ongoing efforts to discourage parking in unsafe areas along the roadway would continue with the project, which proposes to place boulders in areas currently attracting illegally parked vehicles. However, the project would not affect the designated Devil's Gulch parking area or other designated parking areas in Samuel P. Taylor Park. Therefore, the impact is considered less than significant.

(5) Intersection LOS. The project would add 3 peak-hour trips in each direction, which is nominal, and less than normal fluctuation of traffic volumes from day to day. No increase in LOS would be expected, and therefore the proposed project would result in a less than significant impact on intersection operations.

(6) Parking and Internal Circulation. The proposed project is the rehabilitation of an existing roadway and does not have features found in commercial developments such as parking lots and an internal circulation system. Parking along the roadway is discouraged. No designated parking areas in the vicinity of the project area would be affected by the rehabilitation plan. Circulation along the roadway is most noticeably affected by vehicles travelling slower than the average vehicle on the roadway. Three new pullout areas would be added to the roadway. These pullout areas would have a standard width of 12 feet, as shown in Figure 3.4-2. These areas improve traffic flow by providing a safe location for slower vehicles to move off the roadway and allow other vehicles to pass. The proposed project does not significantly affect parking and would improve traffic flow and, therefore, would result in a less than significant impact.

(7) Pedestrian and Bicycle Circulation. Implementation of the project would result in a less hazardous environment for use by pedestrians and bicyclists because the roadway would have a uniform smoother surface, increased paved width where appropriate, and fewer vehicle-turning movements due to the removal of unofficial turnouts and improved sight distance. The combination of these factors would improve pedestrian and bicycle circulation over the existing condition in the project area. Therefore, the post-construction impacts of the proposed project on pedestrian and

bicycle circulation would be beneficial. The Marin County Unincorporated Area Bicycle and Pedestrian Master Plan identifies a Class III bike route along SFDB as part of the proposed bikeway network. The project would not inhibit the completion of that plan. Therefore, the impact is considered less than significant.

(8) Generation of More than 100 Weekday PM Peak-Hour Trips. Rehabilitation of the roadway would not generate additional permanent traffic on the roadway. Construction traffic would result in 58 daily trips during the most intensive phase of construction. Because fewer than 100 weekday PM. peak-hour trips would be generated, this impact is considered less than significant.

Impact TR-1: Project constrution activities could increase roadway hazards during the construction period due to the temporary closure of one travel lane, the presence of construction vehicles, and pavement damage created by construction traffic. (S)

The rehabilitated roadway will not increase hazards within the project area. The proposed project will repair cracking and reduce roughness on the roadway. However, construction activities will require temporary closure of one travel lane at a time, resulting in a temporary hazard to vehicles and bicycles. Additionally, pavement near and surrounding the project site currently shows evidence of cracking and deterioration. This pavement could deteriorate further during project construction. Such deterioration could lead to safety hazards. Traffic delays, safety concerns, and pavement damage created by construction traffic would represent a potentially significant impact.

Mitigation Measure TR-1: For the proposed project or Option A, prior to construction, the project contractor shall submit a Traffic Management Plan (TMP) to Marin County DPW for review and approval. During construction activities, the Marin County DPW and the project contractors working on the project shall adhere to all requirements of the TMP. Implementation of a TMP would reduce potential impacts to a level of less than significant. The TMP shall include the following:

- The route selection for movement of heavy equipment and truck traffic in the project vicinity shall be coordinated with the Marin County DPW, Marin County Sheriff's Department, and Police Department for applicable cities and unincorporated communities (Lagunitas, Forest Knolls, Woodacre, Olema, Point Reyes Station, Nicasio, San Anselmo, San Rafael, and Fairfax), State Parks, and Golden Gate National Recreation Area to minimize traffic and physical road impacts. Truck drivers shall be notified of and required to use the most direct route between the project site and US 101.
- Heavy equipment transport, material transportation, or exportation to and from the project site shall not occur during weekday commute peak traffic periods and shall be coordinated by the contractor with the Marin County DPW, Marin County Sheriff's Department, and relevant city police departments.
- Construction activities shall be coordinated with State Parks, Golden Gate National Recreation, affected cities and communities, and affected property owners to minimize disruption to local traffic.

- Construction worker parking, material storage, and construction staging areas to the extent possible shall be specified and located within the boundaries of the project site in coordination with State Parks personnel.
- Warning signs indicating frequent truck entry and exit shall be posted at the main construction points. Flaggers shall monitor and control ingress and egress of large construction vehicles to and from the site as well as lane closures.
- Debris and mud on nearby streets caused by trucks shall be monitored daily, and a roadway cleaning program shall be instituted as necessary.
- Westbound construction truck trips shall be prohibited on weekdays between the hours of 7:00 a.m. and 9:00 a.m. Eastbound construction truck trips shall be prohibited on weekdays between the hours of 4:00 p.m. and 6:00 p.m.
- A public information program shall be developed and coordinated with local agencies affected by construction activities and/or road closures. The public information program should include measures to inform the public of planned construction activities using means such as print media, radio, and/or web-based messages and information

Significance After Implementation. Implementation of Mitigation Measure TR-1 would reduce the potential traffic safety hazards associated with project construction to ***less-than-significant.***

Impact TR-2: Construction of the project could result in inadequate emergency access. (S)

The proposed project would provide a uniform lane width with improved and wider shoulders where appropriate, a smoother resurfaced roadway, and three official pullouts that can accommodate larger vehicles, including some fire safety equipment. These proposed roadway improvements would result in improved access for fire safety equipment, and the impact is deemed beneficial. During construction, however, lane closures could result in inadequate emergency access.

Mitigation Measure TR-2: A schedule of construction activities and the Traffic Management Plan (TMP) prepared per Mitigation Measure TR-1 shall be provided to any pertinent local emergency service providers, including the Marin County Fire Department, Marin County Sheriff's Department, City of Fairfax Fire and Police Departments, Town of San Anselmo and City of San Rafael Fire and Police Departments, and paramedics.

Significance After Mitigation. Implementation of Mitigation Measure TR-2 would reduce potential emergency vehicle access impacts to a level of ***less than significant***.

Impact TR-3: Construction of the project could affect transit service through the project area during the construction period. (S)

Marin Transit operates a Stagecoach route along SFDB. The Stagecoach Route 68 provides service between San Rafael and Inverness via SFDB, with a bus stop at the campgrounds in Samuel P. Taylor Park at mile marker 17.10. Eastbound service to San Rafael is provided between 6:30 a.m. and 6:11 p.m. and westbound service to Inverness is provided between 8:05 a.m. and 7:53 p.m. Monday through Saturday. Lane closures and other construction activities would result in impacts to the Stagecoach service, particularly during weekdays; however, the impact would be significant in the short-term, lasting only during the construction period.

Mitigation Measure TR-3: Prior to the start of the construction activities, Marin Transit shall be provided with detailed information regarding construction delays to plan a route deviation and/or notify passengers.

Significance After Implementation. Implementation of Mitigation Measure TR-3 would reduce potential impacts to the Stagecoach to a level of ***less than significant***.

4.9 AIR QUALITY

This section has been prepared using methodologies and assumptions recommended in the air quality impact assessment guidelines of the Bay Area Air Quality Management District (BAAQMD).[183] In keeping with these guidelines, this chapter describes existing air quality, impacts the project on local carbon monoxide (CO) levels and impacts vehicular emissions that have regional effects. Project impacts to fish, wildlife, animals and plants are discussed in Section 4.3, Biological Resources. Mitigation measures to reduce or eliminate potentially significant air quality impacts are identified, where appropriate.

4.9.1 Setting

The following discussion provides an overview of existing air quality conditions in the region and the Marin County area. Climate, air quality conditions, and typical air pollutant types and sources are described.

Regional Air Quality. The County of Marin is located in the San Francisco Bay Area, a large shallow air basin ringed by hills that taper into a number of sheltered valleys around the perimeter. Two primary atmospheric outlets exist. One is through the strait known as the Golden Gate, a direct outlet to the Pacific Ocean. The second extends to the northeast, along the west delta region of the Sacramento and San Joaquin Rivers.

Marin County is within the jurisdiction of the BAAQMD. Air quality conditions in the San Francisco Bay Area have improved significantly since the BAAQMD was created in 1955. Ambient concentrations of air pollutants and the number of days during which the region exceeds air quality standards have fallen dramatically. Exceedances of air quality standards occur primarily during meteorological conditions conducive to high pollution levels, such as cold, windless winter nights or hot, sunny summer afternoons.

Ozone (O_3) levels, measured by peak concentrations and the number of days over the State one-hour standard, have declined substantially as a result of aggressive programs by the BAAQMD and other regional, State and federal agencies. The reduction of peak concentrations represents progress in improving public health, however the Bay Area still exceeds the State standard for one-hour ozone. Bay Area levels of PM_{10} have exceeded State standards at least three times per year the last three years; as a result the Bay Area region is considered a nonattainment area for this pollutant relative to the State standards. The Bay Area is an unclassified area for the federal PM_{10} standard. Table 4.9.A shows the Bay Area Attainment Status.

No exceedances of the State or federal CO standards have been recorded at any of the region's monitoring stations since 1991. The Bay Area is currently considered a maintenance area for State and federal CO standards.

Local Climate and Air Quality. Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment. Marin County is bounded on the west by the Pacific Ocean, on the east by San Pablo Bay, on the south by the Golden Gate and on the

[183] Bay Area Air Quality Management District, 1999. *BAAQMD CEQA Guidelines.*

Table 4.9.A: Bay Area Attainment Status

Pollutant	Averaging Time	California Standards [a]		National Standards [b]	
		Concentration	Attainment Status	Concentration[c]	Attainment Status
Ozone (O_3)	8-Hour	0.07 ppm (137 $\mu g/m^3$)	Nonattainment [h]	0.075 ppm	Nonattainment [d]
	1-Hour	0.09 ppm (180 $\mu g/m^3$)	Nonattainment	Not Applicable	Not Applicable [e]
Carbon Monoxide (CO)	8-Hour	9 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Attainment [f]
	1-Hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	Annual Mean	0.030 ppm (57 $\mu g/m^3$)	Attainment	0.053 ppm (100 $\mu g/m^3$)	Attainment
	1-Hour	0.18 ppm (339 $\mu g/m^3$)	Attainment	Not Applicable	Not Applicable
Suspended Particulate Matter (PM_{10})	Annual Mean	20 $\mu g/m^3$	Nonattainment [g]		
	24-Hour	50 $\mu g/m^3$	Nonattainment	150 $\mu g/m^3$	Unclassified
Suspended Particulate Matter ($PM_{2.5}$)	Annual Mean	12 $\mu g/m^3$	Nonattainment [g]	15 $\mu g/m^3$	Attainment
	24-Hour	Not Applicable	Not Applicable	35 $\mu g/m^3$ [i]	Nonattainmnet
Sulfur Dioxide (SO_2)	Annual Mean	Not Applicable	Not Applicable	0.03 ppm (80 $\mu g/m^3$)	Attainment
	24-Hour	0.04 ppm (105 $\mu g/m^3$)	Attainment	0.14 ppm (365 $\mu g/m^3$)	Attainment
	1-Hour	0.25 ppm (655 $\mu g/m^3$)	Attainment	Not Applicable	Not Applicable

Notes: Lead (Pb) is not listed in the above table because it has been in attainment since the 1980s.
ppm = parts per million
mg/m^3 = milligrams per cubic meter
$\mu g/m^3$ = micrograms per cubic meter

[a] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM_{10}, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM_{10} annual standard), then some measurements may be excluded. In particular, measurements are excluded that CARB determines would occur less than once per year on the average. The Lake Tahoe CO standard is 6.0 ppm, a level one-half the national standard and two-thirds the state standard.

[b] National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 g/m^3. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of 98th percentiles is less than 35 g/m^3. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM_{10} is met if the 3-year average falls below the standard at every site. The annual $PM_{2.5}$ standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.

[c] National air quality standards are set by EPA at levels determined to be protective of public health with an adequate margin of safety.

[d] In June 2004, the Bay Area was designated as a marginal nonattainment area of the national 8-hour ozone standard. EPA lowered the national 8-hour ozone standard from 0.80 to 0.75 ppm (i.e., 75 ppb) effective May 27, 2008. EPA will issue final designations based upon the new 0.75 ppm ozone standard by March 2010.

[e] The national 1-hour ozone standard was revoked by EPA on June 15, 2005.

[f] In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.

[g] In June 2002, CARB established new annual standards for $PM_{2.5}$ and PM_{10}.

[h] The 8-hour CA ozone standard was approved by the Air Resources Board on April 28, 2005 and became effective on May 17, 2006.

[i] EPA lowered the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ in 2006. EPA issued attainment status designations for the 35 g/m^3 standard on December 22, 2008. EPA has designated the Bay Area as nonattainment for the 35 ug/m^3 $PM_{2.5}$ standard. The EPA designation will be effective 90 days after publication of the regulation in the Federal Register. President Obama has ordered a freeze on all pending federal rules; therefore, the effective date of the designation is unknown at this time.

Source: Bay Area Air Quality Management District, 2009. Bay Area Attainment Status.

north by the Petaluma Gap. The eastern portion of the County contains small, sheltered valleys which act like a series of miniature air basins.

Marin County has a wedge shape with the southeastern section of the County located closer to the ocean than the northeastern portion. In southern Marin County, the distance from the ocean is short and the elevations are lower, resulting in higher incidence of maritime air in that area.

Wind speeds are highest along the west coast of Marin, averaging about 8 to 10 miles per hour. The complex terrain in central Marin creates sufficient friction to slow the air flow. In portions of San Rafael, the average annual winds speeds are approximately 5 mph. The prevailing wind directions throughout Marin County are generally from the northwest.

The eastside of Marin County has warmer weather than the western side because of the greater distance from the ocean and because the hills that separate eastern Marin from western Marin can block the flow of marine air. The temperatures of the cities next to the Bay are moderated by the cooling effect of the Bay in the summer and the warming effect of the Bay in the winter. San Rafael experiences average maximum summer temperatures in the low-80s and average minimum winter temperatures in the low-40s. Inland towns experience average maximum temperatures that are two degrees cooler in the winter and two degrees warmer in the summer.

Air pollution is highest in eastern Marin County, where most of the population is located in semi-sheltered valleys. In the southeast, the influence of marine air keeps pollution levels low. While Marin County does not have many polluting industries, the air quality on its eastern side, especially along the U.S. 101 corridor, may be affected by emissions from increasing motor vehicle use within and through the county.

Pollutant monitoring results for the years 2005 to 2008 (see Table 4.9.B) at the San Rafael ambient air quality monitoring station (the closest monitoring station to the project site) indicate that air quality in the project area has generally been good. As indicated in the monitoring results, one violation of the State PM_{10} standard and one violation of the federal $PM_{2.5}$ standard was recorded during the 3-year period. State 1-hour O_3 and federal 8-hour O_3 standards have not been exceeded at this monitoring station in the last three years. CO, SO_2, and nitrogen dioxide (NO_2) standards were not exceeded in this area during the three-year period.

Air Pollution Climatology. The amount of a given air pollutant in the atmosphere is determined by the amount of pollutant released and the atmosphere's ability to transport and/or dilute that pollutant. The major determinants of transport and dilution are wind, atmospheric stability, terrain, and for photochemical pollutants, the primary determinant is sunshine.

Air Quality Issues. Five key air quality issues – CO hotspots, vehicle emissions, fugitive dust, odors, and construction equipment exhaust – are described below.

Local Carbon Monoxide Hotspots. Local air quality is most affected by CO emissions from motor vehicles. CO is typically the pollutant of greatest concern, as it is created in abundance by motor vehicles and it does not readily disperse into the air. Because CO does not readily disperse, areas of vehicle congestion can create "pockets" of high CO concentration, called "hot spots." These pockets

Table 4.9.B: Ambient Air Quality at the San Rafael Monitoring Station

Pollutant	Standard	2006	2007	2008
Carbon Monoxide (CO)				
Maximum 1 hour concentration (ppm)		2.6	1.8	1.7
Number of days exceeded:	State: > 20 ppm	0	0	0
	Federal: > 35 ppm	0	0	0
Maximum 8 hour concentration (ppm)		1.5	1.3	1.1
Number of days exceeded:	State: > 9 ppm	0	0	0
	Federal: > 9 ppm	0	0	0
Ozone (O_3)				
Maximum 1 hour concentration (ppm)		0.089	0.072	0.085
Number of days exceeded:	State: > 0.09 ppm	0	0	0
Maximum 8 hour concentration (ppm)		0.058	0.057	0.069
Number of days exceeded:	State: > 0.07 ppm	0	0	0
	Federal: > 0.08 ppm	0	0	0
Coarse Particulates (PM_{10}) [a]				
Maximum 24 hour concentration ($\mu g/m^3$)		64.8	52.6	38.9
Number of days exceeded:	State: > 50 $\mu g/m^3$	1	1	0
	Federal: > 150 $\mu g/m^3$	0	0	0
Annual arithmetic average concentration ($\mu g/m^3$)		18	18	19
Exceeded for the year:	State: > 20 $\mu g/m^3$	No	No	No
	Federal: > 50 $\mu g/m^3$	No	No	No
Fine Particulates ($PM_{2.5}$) [b]				
Maximum 24 hour concentration ($\mu g/m^3$)		20.5	25.7	49.4
Number of days exceeded:	Federal: > 35 $\mu g/m^3$	0	0	1
Annual arithmetic average concentration ($\mu g/m^3$)		ND	ND	ND
Exceeded for the year:	State: > 12 $\mu g/m^3$	ND	ND	ND
	Federal: > 15 $\mu g/m^3$	ND	ND	ND
Nitrogen Dioxide (NO_2)				
Maximum 1 hour concentration (ppm)		0.054	0.057	0.056
Number of days exceeded:	State: > 0.25 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.014	0.014	0.013
Exceeded for the year:	Federal: > 0.053 ppm	No	No	No

Notes: ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
ND = No data. There was insufficient (or no) data to determine the value.
Source: California ARB and EPA, 2009

have the potential to exceed the State 1-hour standard of 20 parts per million (ppm) and/or the 8-hour standard of 9.0 ppm.

While CO transport is limited, it does disperse over time and with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthful levels affecting local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service or with extremely high traffic volumes. In areas with high ambient background CO concentration, air quality modeling is recommended to determine a project's effect on local CO levels.

Vehicle Emissions. Long-term air emission impacts are those associated with changes in automobile travel within the County. Mobile source emissions would result from vehicle trips associated with increased vehicular travel. As is true throughout much of the U.S., motor vehicle use is projected to increase substantially in the region. The BAAQMD, local jurisdictions, and other parties responsible for protecting public health and welfare are continually seeking ways of minimizing the air quality impacts of growth and development in order to avoid further exceedances of the standards.

Fugitive Dust. Fugitive dust emissions are generally associated with demolition, land clearing, exposure of soils to the air, and cut and fill operations. Dust generated during construction varies substantially on a project-by-project basis, depending on the level of activity, the specific operations and weather conditions. The U.S. EPA has developed an approximate emission factor for construction-related emissions of total suspended particulate of 1.2 tons per acre per month of activity. This factor assumes a moderate activity level, moderate silt content in soils being disturbed and a semi-arid climate. The California Air Resources Board estimates that 64 percent of construction-related total-suspended particulate emissions occur in the form of PM_{10}. The emission factors for uncontrolled construction-related PM_{10} emissions are:

- 0.77 tons per acre per month of PM_{10}; or
- 51 pounds per acre per day of PM_{10}.

However, construction emissions can vary greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, weather conditions, and other factors. There are a number of feasible control measures that can be reasonably implemented to significantly reduce PM_{10} emissions from construction. Rather than attempting to provide detailed quantification of anticipated construction emissions from project, the BAAQMD suggests the following:

> "The determination of significance with respect to construction emissions should be based on a consideration of the control measures to be implemented. From the District's [BAAQMD] perspective, quantification of emissions is not necessary, though a lead agency may elect to do so. If all of the control measures indicated as appropriate, depending on the size of the project are implemented, then air pollution from emissions from construction activities would be considered a less-than-significant impact."[184]

[184] BAAQMD, 1996. *BAAQMD CEQA Guidelines Assessing the Air Quality Impacts of Projects and Plans.* April. (Amended in December 1999.)

Odors. Odors are also an important element of local air quality conditions. Specific activities allowed within each of the major Countywide Plan land use categories can raise concerns on the part of nearby neighbors. Major sources of odors include restaurants, manufacturing plants, and agricultural operations. While sources that generate objectionable odors must comply with air quality regulations, the public's sensitivity to locally produced odors often exceeds regulatory thresholds.

Construction Equipment Exhaust. Construction activities cause combustion emissions from utility engines, heavy-duty construction vehicles, equipment hauling materials to and from construction sites and motor vehicles transporting construction crews. Construction-related activities are typically short-term or temporary in duration; however, project generated emissions could represent a significant impact with respect to air quality and/or global climate change. Construction-related activities would result in the generation of criteria air pollutants including CO, sulfur dioxide (SO_2), repairable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less PM_{10} and $PM_{2.5}$ precursors such as, reactive organic gases (ROG) and NOx, and greenhouse gases (GHGs) from exhaust, fugitive, and off-gas emissions. Sources of exhaust emissions could include on-road haul trucks, delivery trucks, worker commute motor vehicles, and off-road heavy –duty equipment. Sources of fugitive emissions (e.g., PM dust) could include construction related activities such as solid disturbance, grading, and material hauling. Sources of off-gas emissions could include asphalt paving and the application of architectural coatings. Exhaust emissions from construction activities vary daily as construction activity levels change. The use of construction equipment results in localized exhaust emissions.

4.9.2 Regulatory Framework

Air quality standards, the regulatory framework, and State and federal attainment status are discussed below.

Air Quality Standards. Both the State and federal governments have established health-based Ambient Air Quality Standards for six air pollutants: CO, O_3, NO_2, SO_2, lead (Pb), and suspended particulate matter (PM). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

In addition to primary and secondary Ambient Air Quality Standards, the State of California has established a set of episode criteria for CO, O_3, NO_2, SO_2, and PM. These episode criteria refer to episode levels, ranging from Stage One to Stage Three, representing periods of short-term exposure to air pollutants that actually threaten public health. Health effects are progressively more severe as pollutant levels increase from Stage One to Stage Three.

California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS) for the criteria air pollutants are listed in Table 4.9.C. Health effects of these criteria pollutants are described in Table 4.9.D.

The BAAQMD is the agency primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and indirect sources (e.g., traffic associated with new development), as well as for monitoring ambient pollutant concentrations. BAAQMD's jurisdiction encompasses seven Bay Area counties—Alameda, Contra Costa, Marin, San Francisco, San Mateo,

Table 4.9.C: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]		Federal Standards[b]		
		Concentration[c]	Method[d]	Primary[c,e]	Secondary[c,f]	Method[g]
Ozone (O_3)	1-Hour	0.09 ppm (180 $\mu g/m^3$)	Ultraviolet Photometry	No federal standard	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 $\mu g/m^3$)		0.075 ppm (147 $\mu g/m^3$)		
Respirable Particulate Matter (PM_{10})	24-Hour	50 $\mu g/m^3$	Gravimetric or Beta Attenuation	150 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 $\mu g/m^3$		–		
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	No Separate State Standard		35 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 $\mu g/m^3$	Gravimetric or Beta Attenuation	15 $\mu g/m^3$		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		–		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.03 ppm (57 $\mu g/m^3$)	Gas Phase Chemiluminescence	0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard	Gas Phase Chemiluminescence
	1-Hour	0.18 ppm (339 $\mu g/m^3$)		–		
Lead (Pb)[h]	30-day average	1.5 $\mu g/m^3$	Atomic Absorption	–	–	–
	Calendar Quarter	–		1.5 $\mu g/m^3$	Same as Primary Standard	High-Volume Sampler and Atomic Absorption
	Rolling 3-month average[i]	–		0.15 $\mu g/m^3$		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	Ultraviolet Fluorescence	0.030 ppm (80 $\mu g/m^3$)	–	Spectrophotometry (Pararosaniline Method)
	24-Hour	0.04 ppm (105 $\mu g/m^3$)		0.14 ppm (365 $\mu g/m^3$)	–	
	3-Hour	–		–	0.5 ppm (1300 $\mu g/m^3$)	
	1-Hour	0.25 ppm (655 $\mu g/m^3$)		–	–	
Visibility-Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of 10 miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		**No Federal Standards**		
Sulfates	24-Hour	25 $\mu g/m^3$	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 $\mu g/m^3$)	Ultraviolet Fluorescence			
Vinyl Chloride[h]	24-Hour	0.01 ppm (26 $\mu g/m^3$)	Gas Chromatography			

Table notes on next page.

[a] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m3 is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
Contact U.S. EPA for further clarification and current federal policies.

[c] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] Any equivalent procedure which can be shown to the satisfaction of the California ARB to give equivalent results at or near the level of the air quality standard may be used.

[e] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[f] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[g] Reference method as described by the EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the EPA.

[h] The California ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[i] National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Source: California Air Resources Board (ARB), November 2008.

Table 4.9.D: Health Effects of Major Criteria Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	• Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	• Contaminated soil.	• Impairment of blood functions and nerve construction. • Behavioral and hearing problems in children.
Suspended Particulate Matter ($PM_{2.5}$ and PM_{10})	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardiorespiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California ARB, 2008.

Santa Clara and Napa—and portions of Solano and Sonoma counties. The California Air Resources Board (ARB) and the U.S. EPA regulate direct emissions from motor vehicles.

Federal Clean Air Act. The 1970 Federal Clean Air Act authorized the establishment of national health-based air quality standards and also set deadlines for their attainment. The Federal Clean Air Act Amendments of 1990 changed deadlines for attaining national standards as well as the remedial actions required of areas of the nation that exceed the standards. Under the Clean Air Act, State and local agencies in areas that exceed the national standards are required to develop State Implementation Plans to demonstrate how they will achieve the national standards for ozone by specified dates.

The Clean Air Act requires that projects receiving federal funds demonstrate conformity to the approved State Implementation Plan and local air quality attainment plan for the region. Conformity with the State Implementation Plan requirements also satisfies the Clean Air Act requirements.

California Clean Air Act. In 1988, the California Clean Air Act required that all air districts in the State endeavor to achieve and maintain California Ambient Air Quality Standards for carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) by the earliest practical date. The California Clean Air Act provides districts with new authority to regulate indirect sources and mandates that air quality districts focus particular attention on reducing emissions from transportation and area-wide emission sources. Each district plan is to achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each nonattainment pollutant or its precursors. Additional physical or economic development within the region would tend to impede the emissions reduction goals of the California Clean Air Act. The State standards for these pollutants are more stringent than the national standards.

The most recent BAAQMD plan for attaining California Ambient Air Quality Standards, the Bay Area 2005 Ozone Strategy, was adopted by the Board of Directors of the BAAQMD on January 4, 2006. The 2005 Ozone Strategy is the fourth triennial update of the BAAQMD's original 1991 Clean Air Plan (CAP). The 2005 Ozone Strategy demonstrates how the San Francisco Bay Area will achieve compliance with the State one-hour air quality standard for ozone and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The Ozone Strategy also includes stationary source control measures, mobile source control measures and transportation control measures.

Attainment Status Designations. The California ARB is required to designate areas of the State as attainment, nonattainment or unclassified for all State air quality standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. Conversely, a "nonattainment" designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An "unclassified" designation signifies that data does not support either an attainment or nonattainment status. The California Clear Air Act divides air districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The U.S. EPA designates areas for O_3, CO, and NO_2 as either "does not meet the primary standards," "cannot be classified," or "better than national standards." For SO_2, areas are designated as "does not

meet the primary standards," "does not meet the secondary standards," "cannot be classified," or "better than national standards." All other areas are designated "unclassified."

Table 4.9.A provides a summary of the attainment status for the San Francisco Bay Area with respect to national and State ambient air quality standards.

Marin Countywide Plan. The Natural Systems and Agriculture Element of the Marin Countywide Plan includes the following policies related to air quality and the proposed project:

Policy AIR-1g Require Control Measures for Construction and Agricultural Activity. Require reasonable and feasible measures to control particulate emissions at construction sites and during agricultural tilling activity, pursuant to the recommendations in the BAAQMD CEQA Guidelines, which may include the following: Watering active construction or agricultural tilling areas; covering hauled materials; paving or watering vehicle access roads; sweeping paved and staging areas.

Policy AIR-3.d: Reduce Peak Hour Congestion. Implement recommended Bay Area Air Quality Management District Transportation Control Measures in the Clean Air Plan to reduce vehicle emissions and congestion during peak commute periods.

Policy AIR-3.e: Improve Arterial Traffic Management. Modify arterial roadways to allow more-efficient bus operation, including possible signal arterial roadways to allow more-efficient bus operation, including possible signal preemption, and expand signal-timing programs where air quality benefits can be demonstrated.

4.9.3 Significance Criteria

A significant impact would occur if the proposed project would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard;
- 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 nonattainment under an applicable federal or State ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

The BAAQMD provides various quantitative thresholds that can be used to better define the above criteria. For ROG,[185] NOx and PM_{10}, an operational net increase of 80 pounds per day is considered significant, while for CO, an increase of 550 pounds per day would be considered significant if it leads to or contributes to CO concentrations exceeding the State Ambient Air Quality Standard of 9 ppm averaged over 8 hours and 20 ppm for 1 hour (i.e., if it creates a "hot spot"). Generally, if a project results in an increase in ROG, NOx, or PM_{10} of more than 80 pounds per day, then it would

[185] Reactive Organic Gases (ROG) are classes of organic compounds that transform with heat and sunlight to form smog or ozone. SO_2 is a reactive organic gas.

also be considered to contribute considerably to a significant cumulative effect. For projects that would not lead to a significant increase of ROG, NOx, or PM_{10} emissions, the cumulative effect is evaluated based on a determination of the consistency of the project with the regional Clean Air Plan.

Impacts from $PM_{2.5}$ emissions have not been analyzed quantitatively as there are no recommended significance thresholds from the BAAQMD. Also, the air quality models that are used to estimate emissions of ROG, NOx, CO and PM_{10} currently do not have the capability to estimate $PM_{2.5}$ separately. Therefore, impacts from $PM_{2.5}$ emissions (particularly the diesel particulate matter) have been analyzed qualitatively.

It should be noted that the emission thresholds were established based on the attainment status of the air basin in regard to air quality standards for specific criteria pollutants. Because the concentration standards were set at a level that protects public health with an adequate margin of safety according to the EPA, these emission thresholds are regarded as conservative and would tend to overstate an individual project contribution to health risks.

4.9.4 Impacts and Mitigation Measures

This section evaluates potential impacts to air quality resulting from the proposed project. The evaluation of environmental effects presented in this section focuses on the issue of consistency with air quality management plans and potential air quality impacts associated construction emissions, odors and operational emissions. Mitigation measures are recommended as appropriate.

Less-than-Significant Impacts. This section provides discussion of several less-than-significant impacts of the proposed project.

(1) Clean Air Plan (CAP) Consistency. The *Bay Area 2005 Ozone Attainment Plan* discussed above is the relevant regional clean air plan. The BAAQMD uses the CAP to evaluate a project's potential cumulative air quality impacts. The *BAAQMD CEQA Guidelines* state that "for any project that does not individually have significant operational air quality impacts, the determination of significant cumulative impacts should be based on an evaluation of the consistency of the project with the local general plan and the general plan with the regional air quality plan." The *BAAQMD CEQA Guidelines* present the following elements for evaluation of consistency between the General Plan (i.e., the Marin Countywide Plan) and the CAP:

- General plan population projections are consistent with CAP and ABAG projections;
- Rate of increase in vehicle miles traveled (VMT) does not exceed rate of increase in population;
- General plan implements CAP transportation control measures; and
- General plan provides buffer zones around sources of odors, toxics and accidental releases.

The proposed project would not require a General Plan Amendment to allow for the rehabilitation of SFDB. The project would not increase population or VMT, therefore, the proposed project is consistent with CAP and ABAG projections for Marin County.

(2) Odor Emissions. During construction, the various diesel-powered vehicles and equipment in use on the project site could create localized odors. These odors would be temporary

and would not be significant beyond the project site boundaries. Heavy-duty trucks traveling along SFDB and on other local roads would generate temporary odors. Impacts from diesel odors would be temporary; their impact on air quality would be less than significant.

The application of asphalt within the project site would also create localized odors. These odors would be temporary and would decrease as the asphalt material hardens and cures. Odors would be limited and temporary and therefore, this impact would be less than significant.

The project would not contain any major sources of odor, and would not be located in an area with existing objectionable odors. It therefore would have a less-than-significant impact.

(3) Operational Emissions. Long-term air emission impacts would be those associated with changes in permanent usage of the project site. The proposed project is the rehabilitation of an existing roadway and there would be no change in land use. The proposed project would not result in an increase in vehicle traffic from current levels. As such, no operational impacts are expected from the proposed project and there would be no increase in vehicle emissions. The completed project would not generate additional vehicle trips or allow for additional vehicles on the roadway; therefore, the proposed project would not significantly increase long term regional or cumulative emissions in the air basin and would not violate air quality standards.

Significant Impacts. The proposed project would result in the following significant impact related to air quality.

Impact AIR-1: Demolition and construction period activities could generate significant dust, exhaust and organic emissions. (S)

Toxic Emissions. Construction of the proposed project would generate toxic emissions through the use of diesel fueled construction equipment. Construction-related emissions are generally short-term or temporary in duration. Construction-related activities could result in the generation of TACs, specifically diesel PM from on-road haul trucks and off-road equipment exhaust emissions. According to the specific health effects of each particular TAC, as identified by the Office of Environmental Health Hazard Assessment (OEHHA) and California ARB in the Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values, the potential cancer risk from the inhalation of diesel PM outweighs the potential noncancerous health impacts. Due to the variable nature of construction activity, the generation of TAC emissions in most cases would be temporary, especially considering the short amount of time such equipment is typically within an influential distance that would result in the exposure of sensitive receptors to substantial concentrations. According to the California ARB, concentrations of mobile-source PM emissions are typically reduced by 70 percent at a distance of approximately 500 feet. In addition, current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40 and 70 years which do not correlate well with the temporary and highly variable nature of construction activities resulting in difficulties with producing accurate estimates of health risk. Therefore, the proposed project would not expose sensitive receptors in the project vicinity to substantial toxic air contaminants.

Regional Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by excavation, grading, hauling, and other activities related

to construction. Emissions from construction equipment also are anticipated and would include CO, NO_x, volatile organic compounds (VOCs), directly-emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants such as diesel exhaust particulate matter.

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, removing or improving existing roadways, and paving roadway surfaces. Construction-related effects on air quality from most roadway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. If not properly controlled, these activities would temporarily generate PM_{10}, $PM_{2.5}$, and small amounts of CO, SO_2, NO_x, and VOCs. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Water or other soil stabilizers can be used to control dust resulting in emission reductions of up to 50 percent. The BAAQMD has established standard measures for reducing the fugitive dust emissions (PM_{10}). With the implementation of the standard construction measures such as frequent watering (e.g., minimum twice per day), fugitive dust emissions from construction activities would not result in adverse air quality impacts.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_x, VOCs and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

SO_2 is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Off-road diesel fuel meeting Federal Standards can contain up to 5,000 ppm of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under California law and ARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel, so SO_2-related issues due to diesel exhaust would be minimal.

The proposed construction schedule for all improvements is approximately 9 months. Construction emissions were estimated for the project using the Sacramento Metropolitan Air Quality Management District's Road Construction Emissions Model, Version 6.3.2 as recommended by the BAAQMD. Construction-related emissions are presented in Table 4.9.E.

Table 4.9.E: Project Construction Emissions

Project Construction Phase	ROG (lbs/day)	CO (lbs/day)	NO_x (lbs/day)	Exhaust PM_{10} (lbs/day)	Fugitive Dust PM_{10} (lbs/day)	Total PM_{10} (lbs/day)
Grubbing/Land Clearing	9.3	35.3	47.1	2.7	10.0	12.7
Grading/Excavation	10.0	38.7	50.9	3.2	10.0	13.2
Drainage/Utilities/Sub-Grade	9.3	33.8	44.2	2.9	10.0	12.9
Paving	7.9	26.1	26.7	2.5	-	2.5
Maximum (lbs/day)	10.0	38.7	50.9	3.2	10.0	13.2
Total (tons/construction project)	**0.9**	**3.5**	**4.5**	**0.3**	**0.8**	**0.8**

The effects of construction activities would be increased dustfall and locally elevated levels of PM_{10} downwind of construction activity. Construction dust would be generated at levels that would create an annoyance to nearby properties. Implementation of the Mitigation Measure AIR-1 would reduce diesel PM exhaust emissions as well as construction PM_{10} impacts.

Mitigation Measure AIR-1: Consistent with guidance from the BAAQMD, the following actions shall be required of construction contracts and specifications for the project.

Demolition. The following controls shall be implemented during demolition:

- Water during demolition of structures and break-up of pavement to control dust generation;
- Cover all trucks hauling demolition debris from the site; and
- Use dust-proof chutes to load debris into trucks whenever feasible.

Construction. The following controls shall be implemented at all construction sites:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be as necessary to minimize the generation of dust.
- 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 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible.
- Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)
- Replant vegetation in disturbed areas as quickly as possible.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

- All construction equipment shall be maintained and properly tuned in accordance with manufacture'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 with the telephone number and person to contact at the County of Marin regarding dust complaints. This person shall respond and take corrective action within 48 hours. The phone number of the BAAQMD shall also be visible to ensure complaints with applicable regulations.

Significance After Implementation. Implementation of Mitigation Measure AIR-1 would reduce construction period air quality impacts to ***less-than-significant*** levels.

Projects, Criteria Pollutants and Public Health. As noted above, the BAAQMD does not recommend quantification of construction period emissions. Rather, the BAAQMD suggests that specific control measures be selected from three different categories: Basic, Enhanced and Optional. The above multi-part mitigation measure includes all of the components from the Basic and Enhanced control measures that could serve to mitigate construction period emissions-particularly fugitive dust.

Despite great progress in air quality improvement, approximately 146 million people nationwide lived in counties with pollution levels above the national standards in 2002. Out of the 230 nonattainment areas identified during the 1990 Clean Air Act Amendment designation process, 124 areas remain under nonattainment status or designation today. In these nonattainment areas, however, the severity of air pollution episodes has decreased. Air quality in the San Francisco Bay Area Air Basin in the past 20 years has improved steadily and dramatically, even with the tremendous increase in population and vehicles and other sources.

As shown in Table 4.9.B, long-term exposure to elevated levels of criteria pollutants could result in potential health effects. However, as stated in the thresholds of significance, emission thresholds established by the BAAQMD are used to manage total regional emissions within an air basin, based on the air basin attainment status for criteria pollutants. These emission thresholds were established for individual projects that would contribute to regional emissions and pollutant concentrations that may affect or delay the projected attainment target year for certain criteria pollutants.

Because of the conservative nature of the thresholds and the basin-wide context of individual project emissions, there is no direct correlation of a single project to localized health effects. One individual project having emissions exceeding a threshold does not necessarily result in adverse health effects for residents in the project vicinity. This condition is especially true when the criteria pollutants exceeding thresholds are those with regional effects, such as ozone precursors like NOx and ROG.

Based on the above discussion, the potential for an individual project to significantly degrade regional air quality or contribute to significant health risk is small, even if the emission thresholds are exceeded by the project. Because of the overall improvement trend in air quality in the air basin, it is unlikely the regional air quality would worsen or health risk increase from the current condition due to emissions from an individual project.

4.10 NOISE

This section describes existing noise conditions in the vicinity of the site, describes criteria for determining the significance of noise impacts, and estimates the likely noise that would result from the proposed project. Where appropriate, mitigation measures are recommended to reduce project-related noise impacts to less-than-significant levels.

4.10.1 Setting

The setting section begins with an introduction to several key concepts and terms that are used in evaluating noise. This section also includes a description of current noise sources that affect the project site and the noise conditions that are experienced in the project site vicinity.

Characteristics of Sound. To the human ear, sound has two significant characteristics: pitch and loudness. A specific pitch can be an annoyance, while loudness can affect our ability to hear. Pitch is the number of complete vibrations or cycles per second of a wave that results in the range of tone from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment, and it is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be precisely measured with instruments.

Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation or sleep.

Several noise measurement scales exist that are used to describe noise in a particular location. A *decibel* (dB) is a unit of measurement that indicates the relative intensity of a sound. The 0 point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3.0 dB or less are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3.0 dB or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. Sound levels in dB are calculated on a logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense, and 30 dB is 1,000 times more intense. Each 10 dB increase in sound level is perceived as approximately a doubling of loudness. Sound intensity is normally measured through the *A-weighted sound level* (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Table 4.10.A shows representative outdoor and indoor noise levels in units of dBA.

Noise impacts can be classified into three categories. The first is audible impacts, which refers to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3.0 dB or greater, since this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1.0 and 3.0 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is changes in noise level of less than 1.0 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Table 4.10.A:Typical A-Weighted Sound Levels

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle at a few feet away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	Reference Level
Near Freeway Auto Traffic	70	Moderately Loud	
Average Office	60	Moderate	1/2 as loud
Suburban Street	55	Moderate	
Light Traffic; Soft Radio Music in Apartment	50	Quiet	1/4 as loud
Large Transformer	45	Quiet	
Average Residence Without Stereo Playing	40	Faint	1/8 as loud
Soft Whisper	30	Faint	
Rustling Leaves	20	Very Faint	
Human Breathing	10	Very Faint	Threshold of Hearing

Source: Compiled by LSA staff

As noise spreads from a source, it loses energy so that the farther away the noise receiver is from the noise source, the lower the perceived noise level is. Geometric spreading causes the sound level to attenuate or be reduced, resulting in a 6 dB reduction in the noise level for each doubling of distance from a single point source of noise to the noise sensitive receptor of concern. There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq} and community noise equivalent level (CNEL) or the day-night average level (L_{dn}) based on A-weighted decibels (dBA). CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally interchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis are specified in terms of maximum levels denoted by L_{max} for short-term noise impacts. L_{max} reflects peak operating conditions and addresses the annoying aspects of intermittent noise.

Another noise scale often used together with the L_{max} in noise ordinances for enforcement purposes is noise standards in terms of percentile noise levels. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level: half the time the noise level exceeds this level, and half the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Existing Vehicular Traffic Noise Levels. Vehicular traffic is the primary source of ambient noise levels in rural Marin County as well as in the project vicinity. The project is located in a wooded area with very few sources of noise besides vehicle traffic. The traffic noise levels for roadway segments along SFDB are listed in Table 4.10.B. This table was generated from data including roadway traffic volumes, vehicle speeds, and roadway geometry, using the Federal Highways Administration (FHWA) Highway Traffic Noise Prediction Model. Existing noise levels along select roadway segments (at 50 feet outward from the roadway center line) range from 58.2 dBA L_{dn} to 61.1 dBA L_{dn}

Table 4.10.B: Existing (2008) Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 L_{dn} (feet)	Centerline to 65 L_{dn} (feet)	Centerline to 60 L_{dn} (feet)	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane
Weekday Conditions					
Sir Francis Drake at Shafter Bridge	2,000	<50	<50	<50	58.2
Sir Francis Drake at Platform Bridge	2,400	<50	<50	<50	59.0
Weekend Conditions					
Sir Francis Drake at Shafter Bridge	3,900	<50	<50	66	61.1
Sir Francis Drake at Platform Bridge	3,300	<50	<50	59	60.3

4.10.2 Regulatory Framework

The following section summarizes the regulatory framework related to noise, including federal, State and Marin County plans, policies and standards.

U.S. Environmental Protection Agency. In 1972 Congress enacted the Noise Control Act. This act authorized the U.S. EPA to publish descriptive data on the effects of noise and establish levels of sound "requisite to protect the public welfare with an adequate margin of safety." These levels are separated into health (hearing loss levels) and welfare (annoyance levels), as shown in Table 4.10.C. The U.S. EPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of the levels.

Table 4.10.C: Summary of EPA Noise Levels

Effect	Level	Area
Hearing loss	$L_{eq}(24) \leq 70$ dB	All areas.
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq}(24) \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{eq} \leq 45$ dB	Indoor residential areas.
	$L_{eq}(24) \leq 45$ dB	Other indoor areas with human activities such as schools, etc.

Source: U.S. Environmental Protection Agency, 1974. "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety." March.

For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to a $L_{eq(24)}$ of 70 dB. The "(24)" signifies a L_{eq} duration of 24 hours. The U.S. EPA activity and interference guidelines are designed to ensure reliable speech communication at about 5 feet in the outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively.

The noise effects associated with an outdoor L_{dn} of 55 dB are summarized in Table 4.10.D. At 55 dB L_{dn}, 95 percent sentence clarity (intelligibility) may be expected at 3.5 meters, and no community reaction. However, 1 percent of the population may complain about noise at this level and 17 percent may indicate annoyance.

Table 4.10.D: Summary of Human Effects in Areas Exposed to 55 dBA L_{dn}

Type of Effects	Magnitude of Effect
Speech – Indoors	100 percent sentence intelligibility (average) with a 5 dB margin of safety.
Speech – Outdoors	100 percent sentence intelligibility (average) at 0.35 meters. 99 percent sentence intelligibility (average) at 1.0 meters. 95 percent sentence intelligibility (average) at 3.5 meters.
Average Community Reaction	None evident; 7 dB below level of significant complaints and threats of legal action and at least 16 dB below "vigorous action."
Complaints	1 percent dependent on attitude and other non-level related factors.
Annoyance	17 percent dependent on attitude and other non-level related factors.
Attitude Towards Area	Noise essentially the least important of various factors.

Source: U.S. Environmental Protection Agency, 1974. "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety." March.

State of California. The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the "State Noise Insulation Standard," it requires buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in the California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA CNEL in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA CNEL.

The State has also established land use compatibility guidelines for determining acceptable noise levels for specified land uses. However, the County has adopted and modified the State's land use compatibility guidelines, as discussed below.

Marin Countywide Plan. Marin County addresses noise in both the Noise Element of the Countywide Plan and in the Construction Noise Guidelines of the Marin County Municipal Code. The following are the Marin County Policies from the Noise Element of the Countywide Plan that relate to the proposed project:

Goal NO-1: Protection from Excessive Noise. Ensure that new land uses, transportation activities, and construction do not create noise levels that impair human health or quality of life.

Policy NO-1.2: Minimize Transportation Noise. Ensure that transportation activities do not generate noise beyond acceptable levels, including in open space, wilderness, wildlife habitat, and wetland areas.

Policy NO-1.3: Regulate Noise Generating Activities. Require measures to minimize noise exposure to neighboring properties, open space, and wildlife habitat from construction-related activities, yard maintenance equipment, and other noise sources, such as amplified music.

> *Program NO-1.i: Regulate Noise Sources.* Sections 6.70.030(5) and 6.70.040 of the Marin County Code establish allowable hours of operation for construction-related activities. As a condition of permit approval for projects generating significant construction noise impacts during the construction phase, construction management for any project shall develop a construction noise reduction plan and designate a disturbance coordinator at the construction site to implement the provisions of the plan.

The Marin Countywide Plan specifies that "during all phases of construction, measures should be taken to minimize the exposure of neighboring properties to excessive noise levels from construction-related activity." In addition, Marin County reserves the right to set hours for construction-related activities involving the use of machinery, power tools or hammering. The hours of construction would be determined by the type of construction, site location and noise sensitivity of nearby land uses and would be specified in the conditions of approval for the project.

Marin County Code Noise Ordinance. Sections 6.70.030(5) and 6.70.040 of the Marin County Code establish allowable hours of operation for construction-related activities.

Hours for construction activities shall be limited to Monday through Friday between the hours of 7:00 a.m. and 6:00 p.m. and Saturdays from 9:00 a.m. to 5:00 p.m. Construction activities are prohibited on Sundays and holidays.

The ordinance also specifies that loud noise-generating construction-related equipment (e.g., backhoes, generators, jackhammers) can be maintained, operated, or serviced at a construction site for permits administered by the Community Development Agency. Limitations to the ordinance may occur for certain emergencies or with written permission.

4.10.3 Significance Criteria

A project would have a significant noise effect if it would substantially increase the ambient noise levels for adjoining areas or conflict with adopted environmental plans and goals of the community in which it is located. The applicable noise standards governing the project site are the State's noise criteria, the Noise Element of the Marin Countywide Plan, and applicable sections of the Marin County Municipal Code. For the purposes of this project, a noise impact is considered significant if the project would result in:

- The exposure of people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies.

- Result in a 5 dBA permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- Result in a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- For projects within an area covered by an airport land use plan or within two miles of a public airport or public use airport when such an airport land use plan has not been adopted, or within the vicinity of a private airstrip, expose people residing or working in the project site to excessive aircraft noise levels.
- Expose people to or generate excessive groundborne vibration or groundborne noise levels.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant noise impact if:

- The project would generate noise that would conflict with countywide noise standards or other state or local noise standards.
- The project proposes land uses that substantially increase noise levels in areas of sensitive receptors.
- The land use proposed by the project would be incompatible with the baseline noise levels.

4.10.4 Impacts and Mitigation Measures

This section discusses potential noise impacts that could result from the proposed project and identifies mitigation measures, if appropriate. Less-than-significant impacts are discussed first, followed by significant impacts.

Less-Than-Significant Noise Impacts. The following noise types/sources would produce less-than-significant noise effects at or near the project site.

(1) Vibration Impacts. The proposed roadway re-surfacing project would not contain perceptible sources of long-term ground borne vibration. Therefore long-term ground borne vibration impacts from the project would be less than significant on park visitors, motorists, bicyclist and hikers. Furthermore, there would be no long term vibration impacts on wildlife in the project area. The existing roadway surface is in such a deteriorated condition that large trucks traveling over the roadway create ground borne vibration. The new roadway surface will reduce the level of ground borne vibration from truck traffic on SFDB. Accordingly, the impacts from vibration are deemed less-than-significant.

(2) Aircraft Noise. The Gnoss Field Airport and the San Rafael Airport are located in Marin County. Due to the project site's distance from these airports, stated flight paths, and orientation of runways, SFDB is not located within the 55 dBA CNEL noise contour for either of these airports. The proposed project is not a noise sensitive receptor and therefore any noise from aircraft over-flights would be less than significant. Therefore, the noise effect from aircraft noise sources is less than significant for the project.

(3) Operational Period Impacts. The proposed project is not expected to increase traffic on SFDB; therefore, the project would not increase permanent noise levels at sensitive receptors in the project vicinity. Additionally, the proposed project would replace the existing asphalt concrete with RAC, which is a road material made of recycled tires that has been successfully used in California since the 1970's. The use of RAC has a beneficial effect with respect to noise of reducing vehicle noise on roadways. Research by state highway departments have proven this fact including a 1999 study by Sacramento County which concluded that the use of rubberized asphalt on County roadways resulted in a 4 dBA reduction in noise levels over that provided with conventional asphalt.[186] Therefore, once the proposed project is complete, noise levels in the vicinity of the project site would be substantially reduced over existing conditions.

Impact NOI-1: Construction period activities could create significant short-term noise impacts on noise sensitive receptors in the project area. (S)

The project area is currently bordered by open space/wildlife habitat, a residential unit and recreational uses. Project construction would result in short-term noise impacts on these adjacent land uses. Noise levels from construction activities such as excavation and finished grading for the proposed project may range up to 91 dBA L_{max} at 50 feet from the active construction area for a limited time period.

The transport of workers and construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the site. Noise impacts from trucks would occur on the site for the duration of the construction period. Workers and construction equipment would use existing access routes. Noise from passing trucks (87 dBA L_{max} at 50 feet) would be similar to existing truck-generated noise.

Table 4.10.E: Typical Construction Equipment Noise Level

Type of Equipment	Range of Sound Levels Measured (dBA at 50 feet)	Suggested Sound Levels for Analysis (dBA at 50 feet)
Pile Drivers	81 to 96	93
Rock Drills	83 to 99	96
Jackhammers	75 to 85	82
Pneumatic Tools	78 to 88	85
Pumps	74 to 84	80
Scrapers	83 to 91	87
Haul Trucks	83 to 94	88
Cranes	79 to 86	82
Portable Generators	71 to 87	80
Rollers	75 to 82	80
Dozers	77 to 90	85
Tractors	77 to 82	80
Front-End Loaders	77 to 90	86
Hydraulic Backhoe	81 to 90	86
Hydraulic Excavators	81 to 90	86
Graders	79 to 89	86
Air Compressors	76 to 89	86
Trucks	81 to 87	86

Source: Bolt, Beranek & Newman, 1987. *Noise Control for Buildings and Manufacturing Plants.*

Construction of the proposed project would require the use of earthmovers such as bulldozers and scrapers, loaders and graders, pavement breakers, haul trucks, water trucks, asphalt paving equipment and pickup trucks. Pile drivers and rock drills are not expected to be used on a regular basis during construction. As shown in Table 4.10.E, the typical maximum noise level generated by each earthmover on the project site is assumed to be 88 dBA L_{max} at 50 feet from the operating earthmover. The maximum noise level generated by water and pickup trucks is approximately 86 dBA L_{max} at 50 feet from these vehicles. Each doubling of the sound sources with equal strength would increase the noise level by 3

[186] County of Sacramento, 1999. *Report on the Status of Rubberized Asphalt Traffic Noise Reduction in Sacramento County*. November.

dBA. Assuming each piece of construction equipment operates at some distance apart from the other equipment, the worst-case combined noise level during this phase of construction would be 91 dBA L_{max} at a distance of 50 feet from an active construction area.

Project construction would also include tree removal and retaining wall construction, particularly under Option A. However, these construction activities would not be conducted in close proximity to sensitive noise receptors and would not change the noise analysis described below.

The closest sensitive receptor in the project vicinity is a ranch residence approximately 100 feet north of SFDB at the western end of the project alignment (near the intersection of SFDB and Platform Bridge Road), and a park ranger residence located in the Samuel P. Taylor State Park approximately 50 feet north of the project alignment near the entrance to Camp Taylor. Other park ranger residence facilities are located approximately 420 feet south of the project alignment near Deadman's Curve. The entrance to Samuel P. Taylor State Park is off the roadway approximately 1.5 miles from the eastern endpoint. The project roadway runs through the State and federal parks; however, camp sites are not located within 400 feet of project construction activities. Day use recreational users of the parks and bicyclists would likely~~could~~ be affected by construction noise.

Construction traffic would temporarily increase traffic noise along SFDB. Project construction traffic would use and be concentrated along SFDB with some traffic (approximately 10 percent) routed to the Redwood Landfill north of the City of Novato during debris removal activities (east on SFDB). Water trucks used during construction would obtain loads of water through a private source either in Olema or Point Reyes Station (west on SFDB). Trucks would haul rubberized asphalt from Dutra Materials in San Rafael along SFDB between San Rafael and the project site (east on SFDB). Miscellaneous trips in smaller trucks and autos (workers) would come from elsewhere in Marin and Sonoma Counties and possibly other locations in the San Francisco Bay Area (east on SFDB). Most of the debris (crushed asphalt) would be processed by an on-site crushing plant and reused as base material for the roadway at the project site.

As a result, the project would add 2 inbound and 2 outbound trips to the west per weekday and 16 inbound and 16 outbound trips to the east per weekday for the first 130 days. During the last 53 days, the project would add no trips to the west and 16 inbound and 16 outbound trips per weekday to the east. The impact of project related traffic when averaged over the 24 hour period would result in a traffic noise increase of less than 1 dBA. All trips added by the project are temporary and would cease when construction is complete. Therefore, noise associated with truck traffic would not be permanent, but would result in a temporary increase in ambient noise levels.

Option A. This option would include the removal of nine trees along the roadway to accommodate for a more uniform width and additional shoulder area. To achieve the uniform width, additional low retaining walls would be installed. In addition, a large dump truck could be used on occasion to transport any excavated tree stumps and removal of trees would generate additional construction noise. There would be a temporary, localized increase in noise levels in areas where trees would be removed.

Construction noise would result in a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Mitigation Measure NOI-1a: During all construction, the project contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards. During construction, the County shall monitor noise levels to ensure they remain below 95 dBA measured 50 feet from the noise source.

Mitigation Measure NOI-1b: The project contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the active project site.

Mitigation Measure NOI-1c: The construction contractor shall locate equipment staging in areas that will create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the active project site during all project construction.

Mitigation Measure NOI-1d: The construction contractor shall ensure that all general construction related activities are restricted to Monday through Friday between the hours of 7:00 a.m. and 6:00 p.m. Construction activities shall not be conducted on Saturdays, Sundays and holidays.

Mitigation Measure NOI-1e: The Marin County DPW shall post an information sign at entrances to the construction zones easily visible to the public. The signs shall identify the permitted construction hours and the name, telephone number, and other pertinent contact information and list of responsibilities for the entity responsible for overall construction and noise management. The information signs shall also provide a means for members of the public to receive information about project construction. The County DPW shall record all noise complaints received and actions taken in response. Informational signs shall be posted for the duration of project construction.

Mitigation Measure NOI-1f: The project manager shall be responsible for responding to any local complaints about construction noise. The project manager will determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will determine and implement reasonable measures warranted to correct the problem.

Significance After Implementation. Implementation of Mitigation Measures NOI-1a through NOI-1f would limit construction activities to the less noise-sensitive periods of the day and would reduce construction noise impacts to a ***less than significant*** level.

4.11 PUBLIC SERVICES AND UTILITIES

This section analyzes the proposed project's potential impacts on the following public services and utilities: fire protection, police services, schools, parks and recreation, water supply, wastewater collection and treatment, and solid waste. Potential impacts to public services and utilities that could result form the proposed project are identified, and mitigation measures are recommended, as appropriate. The information presented in this section is based on information provided on the Marin County Fire Department (MCFD) website[187], on the Marin County Sheriff's Office (MCSO) website[188], and from the Marin County Office of Education (MCOE)[189].

4.11.1 Setting

In this setting section, current services and capacities are discussed.

Fire Protection and Emergency Medical Services. Fire protection and emergency medical services for the project site would be provided by MCFD. The MCFD maintains two fire stations in the area: the Woodacre Station and the Point Reyes Station. The Woodacre station would respond to a fire on the central to eastern portion of the project site and the Point Reyes Station would respond to fire on the western end of the project alignment. Both fire stations could respond to situations in either jurisdictional area, as needed.

The Woodacre Station is located at 33 Castle Rock Road in Woodacre, 3 miles east of the eastern boundary of the project site. The Woodacre station would respond to a fire on the central to eastern portion of the project site. The equipment at the Woodacre Station includes: one Type 1 engine (designed for structural protection), three Type 3 engines (designed for wildland fires), one water tender, one bulldozer, one dozer tender, two rescue ambulances, one stakeside, and two utility vehicles. Existing personnel at the Woodacre Station includes 12 paid firefighters (all trained as emergency medical technicians or higher), one clerical staff person, one finance officer, and six seasonal firefighters. At least eight paid firefighters are on duty at all times.

The Point Reyes Station is located at 401 B Street in Point Reyes Station, 5 miles to the west of the western boundary of the project site. The equipment at Point Reyes Station includes: one Type 1 engine (designed for structural protection), one Type 3 engine (designed for wildland fires), one rescue ambulance, one utility vehicle, and one flood boat. The MCFD also has access to air-support equipment for rescue and firefighting as needed. Existing personnel at the Point Reyes Station includes four paid firefighters (all trained as emergency medical technicians or higher), one clerical staff person, one finance officer, and two seasonal firefighters. At least four paid firefighters are on duty at all times.

The MCFD responds to approximately 3,000 calls for service a year, of which about 65 to 70 percent are for medical aid. The estimated response time to the site is about 5 minutes on average. The MCFD has an automatic aid agreement with the Marin County Mutual Aid Pact, which allows the MCFD to request aid, when needed, from any department in the County.

[187] Marin County Fire Department website, 2009. (http://www.xmrfire.org/mrn/about/stations.aspx)
[188] Marin County Sherriff's Department website, 2007. (http://www.marinsheriff.org/)
[189] Marin County Office of Education website, 2003 (http://www.marinschools.org/)

The MCFD Woodacre Station operates two rescue ambulances and a rescue squad for advanced rescue situations. The MCFD Point Reyes Station operates one rescue ambulance and a rescue squad for advanced rescue situations. In addition, paramedics and emergency medical technicians are provided through various agreements with local fire protection districts. Transportation of patients would be to the nearest medical facility (Marin General Hospital in Greenbrae), about a 30-minute drive from the project site.

"Fire flow" refers to the duration and pressure of water flow during fire fighting, typically measured in gallons per minute. According to the MCFD, there are no water mains or fire hydrants along the project route. If required, firefighting units from the Woodacre and Point Reyes Stations would respond to emergency events requiring fire suppression equipment. These firefighting units are self-contained and carry their own water supply. For larger fires, aerial firefighting equipment is available to the MCFD from other fire districts.

Areas surrounding the project site contain relatively steep slopes and dense concentrations of flammable vegetation. Under the appropriate weather conditions, a fire could start adjacent to the project site. Similarly, a fire starting off the project site could spread onto the project site. Few homes or structures are located in the immediate project area. A fire starting on the project site could burn residences adjacent to SFDB and spread to other residences in the general area. Similarly, a fire starting adjacent to the project site could spread to the site, threatening construction workers and other persons traveling along SFDB.

Under most circumstances, work crews at the project site would have sufficient time to see a fire and evacuate the area. The MCFD rates the project area as having a "moderate" to "high" fire hazard. The possibility and risks of an on-site generated wildfire are addressed in Section 4.7, Hazards and Hazardous Materials.

Police Services. The Marin County Sheriff's Office (MCSO) provides police protection in the project area. The project site lies within Beat 22 of the MCSO Area 2 Patrol District, which includes the communities of Point Reyes Station and Woodacre.

The Kentfield Substation serves Beat 22. This substation has one dedicated deputy on patrol at all times in this area. The officer works closely with a team of three or more other officers and a supervising officer who patrol nearby areas through the San Rafael office. The Sheriff's Office also works closely with other local city police departments as part of a Mutual Aid Agreement to call in resources to a major event.

Response times to the project site vary from a few minutes to up to twenty minutes, depending on the location of the responding patrol car, time of day, and traffic.

Schools. Three school districts provide public education services in the project area: 1) Lagunitas School District; 2) Tamalpais Union High School District; and 3) Shoreline Unified School District.

The Lagunitas School District (LSD) operates two schools: Lagunitas School at P.O. Box 308 in San Geronimo (grades K-8) and San Geronimo Valley Elementary School at 1 Lagunitas School Road in San Geronimo (grades K-6). Lagunitas School has a capacity for 150 students, and its current enrollment is 140 students. San Geronimo Valley Elementary School has a capacity for 150 students,

and its current enrollment is 147 students. The bus route for the Lagunitas School District runs from Sir Francis Drake and Tamal Road through Woodacre and San Geronimo to the two schools; the bus route does not traverse the project area.

The Tamalpais Union High School District (TUHSD) extends from the Golden Gate Bridge to the San Rafael city limits. The TUHSD operates five high schools (serving grades 9 through 12). The Students in the project area would attend Sir Francis Drake High School in San Anselmo. The current enrollment of Sir Francis Drake High School is 1,049 students. The TUHSD projects enrollment at each high school in five-year increments based on an average of the continuation of enrollment from students in lower grades. This method generally has proven to be accurate within one to three percent of actual enrollment. Since March 2001, the TUHSD has passed two bond issues to modernize various facilities at Sir Francis Drake High School. Once renovations are completed, the school is expected to have sufficient capacity for the next 10 to 20 years.

No school bus route serves Sir Francis Drake High School. Students can take Marin Transit to/from school. Currently, there are 12 *local* fixed routes that operate on weekdays with limited weekend and holiday schedules, and 6 *supplemental school service* routes that operate during school days. Golden Gate Transit also operates 1 seasonal local shuttle route and 1 seasonal supplemental school service route. Routes 125 and 126 serve Sir Francis Drake High School. Route 125 runs between San Anselmo and Lagunitas and provides service to Lagunitas School, as well as Sir Francis Drake H.S. Route 126 runs from San Rafael to Sleepy Hollow and provides access to Sir Francis Drake High School, Brookside Schools, and San Domenico School. Neither of these routes traverse the project area.

The Shoreline Unified School District (SUSD) operates six schools: Bodega Bay Elementary School on 1200 Cannon Street in Bodega Bay (grades K-5), Inverness Elementary School at P.O. Box 300 in Point Reyes Station (grades K-1), Tomales Elementary School on 40 John Street in Tomales (grades K-8), West Marin Elementary School on 11550 State Route 1 in Point Reyes Station (grades 2-8), Tomales High School on Irvin Road in Tomales (grades 9-12), and Shoreline Independent Study School (grades 8-12). Bodega Bay Elementary School currently has 35 students enrolled. Inverness Elementary School currently has 43 students enrolled. Tomales Elementary School currently has 178 students enrolled. West Marin Elementary School currently has 134 students enrolled. Tomales High School currently has 173 students enrolled. Shoreline Independent Study School currently has 6 students enrolled. Buses serving the SUSD use Lucas Valley Road to transport students to and from school; they do not traverse the project area.

Parks and Recreation. Land uses surrounding the project site consist primarily of recreational uses. Surrounding land is owned by the State of California and the federal government and is administered as a State Park (Samuel P. Taylor State Park) and a federal recreation area (GGNRA). Camping facilities are located within Samuel P. Taylor State Park, just south of SFDB, adjacent to the project area.

Water Supply. Potable water supply services in the project area are provided by Samuel P. Taylor State Park, which maintains several small water reservoirs, a potable water treatment plant, a water pumping station, storage tanks, and other water-related infrastructure. Water is supplied to two (2) main reservoirs, is supplied from wells, and is delivered by two (2) separate pipelines, each

approximately 0.25 miles in length, that run along the north side of SFDB approximately 3 to 6 feet from the road edge.

The project area is not currently served by any Marin Municipal Water District (MMWD) facilities. However, the MMWD maintains a transition water pipeline that follows the old railroad grade/Cross Marin Bicycle Path to the south of SFDB. This waterline transports water supplies through the project area, but provides no supplies to the area.

Wastewater Treatment and Collection. The proposed project is entirely within Samuel P. Taylor State Park and Golden Gate National Recreation Area. Currently, the only wastewater collection, treatment, and disposal system is located within the confines of Samuel P. Taylor State Park. Wastewater facilities include restroom and shower facilities within campground and picnicking areas. Samuel P. Taylor State Park has a small wastewater treatment facility that treats wastewater generated within park facilities. Wastewater is collected at the restroom and shower facilities and is transported to the wastewater treatment facility via a piping system located under the ground surface. State Park employee housing generated waste water is treated locally within septic tank/pit systems located near the housing facilities. No other wastewater facilities, including local wastewater districts, are found in the project area.

Solid Waste. The Marin County Hazardous and Solid Waste Management Authority has jurisdiction over landfills in the county. Two disposal facilities are located in Marin County, the Marin Resource Recovery Center and the Redwood Sanitary Landfill/Composting Facility. The Redwood Sanitary Landfill/Composting Facility is located at 8950 Redwood Highway in Novato, and the Marin Resource Recovery Center is located at 565 Jacoby Street in San Rafael. Both facilities receive solid waste from the project area.

According to the California Integrated Waste Management Board (CIWMB), total residential and non-residential waste disposal in Marin County amounts to 222,266 tons per year. Shoreline Disposal, Inc. provides waste collection service in the project site and vicinity. Services include weekly refuse and recycling collection and monthly service for green cans (for yard waste). Residential customers must purchase their own 20-, 32, or 45-gallon can. Each size has its own separate rate. “Single stream” recycling carts are also available for pick-up of recyclables (e.g., paper and cardboard, glass bottles and jars, plastic containers, and metal cans) on the regular pick-up day.

The Redwood Sanitary Landfill currently accepts 1,290 tons of household waste per day and has approximately 12 million cubic yards of currently permitted capacity available. The landfill is permitted to accept up to a maximum of 2,300 tons of waste per day. The landfill accepts waste from Sonoma County as well as Marin County. An expansion permit currently under consideration would increase the landfill capacity from 19.1 to 34.8 million cubic yards of capacity.

4.11.2 Regulatory Framework

Policies relevant to public services in the vicinity of the project site are drawn from the Marin CWP (2007) and the Marin Integrated Waste Management Plan. State laws and regulations pertaining to solid waste also apply to the project area.

California Solid Waste Reuse and Recycling Access Act of 1991. The California Solid Waste Reuse and Recycling Access Act of 1991 (Public Resources Code Sections 42900 through 42911) requires that any development project for which an application for a building permit is submitted shall include adequate, accessible areas for collecting and loading recyclable materials.

Integrated Waste Management Act. California state law AB 939, known as the Integrated Waste Management Act, was passed in 1995 to address the increases in the state waste stream and decrease in landfill capacity. AB 939 mandates a reduction of waste being disposed and required jurisdictions to divert 25 percent of waste out of landfills by 1995 and 50 percent by 2000. The law requires that, after 2000, jurisdictions maintain a diversion rate of 50 percent.

Marin County Integrated Waste Management Plan. In August of 1996 Marin County and its incorporated cities and towns (Belvedere, Corte Madera, Fairfax, Larkspur, Mill Valley, Novato, Ross, San Anselmo, San Rafael, Sausalito, Tiburon) formed the Marin Hazardous and Solid Waste Joint Powers Authority (JPA). The JPA provides household hazardous waste collection, and recycling and disposal information to ensure Marin's compliance with State recycling mandates and other education for the citizens and businesses of Marin County. In 1997, the CIWMB recognized the JPA as a Regional Agency. This Regional Agency status allows the JPA members to report to the State as one political body (instead of 12) as was previously required. Marin County's public agencies, private waste haulers, and facility operators developed Marin County's Integrated Waste Management Plan, which was adopted in April 1998. The Marin County Integrated Waste Management Plan implemented recycling programs necessary to meet the State's 25-percent and 50-percent recycling mandates and incorporates a Countywide Siting Element (CSE) and Regional Summary Plan (RSE).

Marin Countywide Plan (2007). Marin County has recently completed the process of updating the CWP. Policies relevant to the provision of public services include:

Goal PFS-1 Adequate Public Facilities and Services. Provide basic public facilities to accommodate the level of development planned by cities and towns in the County.

Policy PFS-1.2 Plan Effectively to Minimize Costs. Plan public facilities in cooperation with service providers to minimize short- and long-term construction, operation, and maintenance costs.

Policy PFS-1.4 Reduce Demand on Public Facilities. Reduce per capita and total demand for water and wastewater treatment, and enhance storm water management through integrated and cost effective design, technology, and demand reduction standards for new development and redevelopment.

> *Implementing Program PFS-1.d Reduce Demand on Public Facilities.* Assess and revise community development and facilities rules to incorporate least-cost (including environmental, economic, and societal costs) and integrated resources planning for water, wastewater, and storm water infrastructure.

Goal PFS-2 Sustainable Water Resources. Assure a reliable, sustainable water supply for existing and future development while protecting the natural environment.

Policy PFS-2.1 Conserve Water and Utilize Sustainable Sources. Promote conservation to increase the responsible use and reliability of water supplies. Reduce the waste of potable water through efficient technologies, design, and management practices, and through better matching of the source and quality of water to the user's needs.

Policy PFS-2.3 Manage Water Resources Sustainably. Manage water resources to ensure equitable amounts of clean water for all users, to support wildlife habitat, and to preserve natural resources within the sustainable limits of water supplies. (See also the Natural Systems and Agriculture Element, Water Resources Section.)

Goal PFS-3 Reduction, Safe Processing, and Reuse of Wastewater. Continue to enhance the Alternative Onsite Wastewater Monitoring Program. This program ensures the proper operation of alternative and innovative wastewater system designs. Continue to work with manufacturers, designers, installers, end users, and the Regional Water Quality Control Board to evaluate the effectiveness and capabilities of these alternatives to traditional septic system designs. Work with stakeholders to periodically update design guidelines and regulations in the light of evolving best practices.

Policy PFS-3.1 Reduce Toxics in Wastewater. Minimize the potential for pollution to water and other resources from sewage treatment.

Policy PFS-3.2 Promote Alternative Wastewater Systems. Enhance water quality through use of alternative wastewater treatment methods.

Policy PFS-3.3 Reduce Storm Water Volume. Implement appropriate upstream water-saving technologies to reduce storm water volumes and increase percolation. Increase permeable surfaces and encourage on-site percolation to reduce storm water volume and potential overflow of wastewater treatment facilities.

Implementing Program PFS-3.a Reduce Wastewater Volume. Work with sanitary districts and Environmental Health to assess alternative point-source wastewater technologies, including State approved graywater systems; NSF-approved waterless urinals and composting toilets; pervious surfaces for roads, driveways, and parking lots; and subsurface drip dispersal. Provide public information and update codes to promote safe, appropriate technologies. Urge water districts to consider volumetric billing and tiered water rate structure, and partner with waste disposal providers to reduce the volume of wastewater that must be treated.

Implementing Program PFS-3.d Enforce Regulations. Continue to update and enforce regulations for septic systems and groundwater wells that ensure that safe drinking water will continue to be available (see also WR-2.c and PFS-3.c).

Goal PFS-4 Efficient Processing and Reduced Landfill Disposal of Solid Waste. Minimize, treat, and safely process solid waste materials in a manner that protects natural resources from pollution while planning for the eventual reuse or recycling of discarded material to achieve zero waste.

Policy PFS-4.1 Reduce the Solid Waste Stream. Promote the highest and best use of discarded materials through redesign, reuse, composting, and shared producer responsibility. Emphasize a closed-loop system of production and consumption.

Policy PFS-4.2 Protect Environmental Health. Require the use of waste processing and disposal techniques that prevent the contamination or other impairment of natural resources.

Implementing Program PFS-4.b Divert Construction Waste. Continue to implement the construction and demolition recycling waste ordinance to divert construction waste from landfills.

Implementing Program PFS-4.c Reduce Waste at Landfill. Continue to pursue aggressive recycling, resource recovery, and composting strategies to reduce the amount of waste diverted to landfill.

4.11.3 Significance Criteria

Appendix G of the *CEQA Guidelines* provides that a project may have a significant impact on public services and utilities if it would:

- Result in substantial adverse physical impacts associated with provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable services ratios, response times, or other performance objectives for any of the following public services:
  a) Fire protection
  b) Police protection
  c) Schools
- Increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.
- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- Have insufficient water supplies available to serve the project from existing entitlements and resources.
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs.
- Not comply with federal, state, and local statutes and regulations related to solid waste.

Based on Appendix N of the Marin County Environmental Impact Review Guidelines (1994), the project may have a significant impact related to public services if it would:

- Require additional police/sheriff staffing, facilities, or equipment to maintain acceptable service ratios.
- Require additional fire staff, facilities, or equipment to maintain an acceptable level of service (e.g., response time, rating, other).
- Require additional school capacity or facilities.
- Require designation of additional parkland to remain in conformance with locally acceptable or adopted park standards.
- Propose a significant increase in the consumption of potable water.
- Require substantial expansion of water supply, treatment or distribution facilities.
- Require expansion of wastewater treatment or distribution facilities.
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs.

4.11.4 Impacts and Mitigation Measures

This section discusses potential impacts to public services and utilties that could result from the proposed project and identifies mitigation measures, if appropriate. Less-than-significant impacts are discussed first, followed by significant impacts. Water quality (as opposed to water supply) impacts related to stormwater runoff are discussed in Section 4.6, Hydrology and Water Quality

(1) Fire Protection. As with all types of construction work, the possibility of on-site injury exists. The number of calls for service for fires and medical emergencies could increase due to project implementation. If the project were implemented consistent with MCFD requirements, then the project would not result in a substantial increase in calls for service. Implementation of the project would not require the MCFD to construct or expand fire stations, hire additional staff, or purchase additional equipment. It is also expected that with proper traffic management (see Section 4.8, Traffic and Circulation) the project would not result in substantial congestion of local roadways or significantly interfere with emergency response or evacuation in the area. The project, as currently proposed, is consistent with MCFD requirements that would allow safe and efficient access and fire suppression.

According to the MCFD, there are no fire flow lines to the project site. No water mains are currently present. All water sources needed for fire suppression would have to be imported by self-contained fire fighting units. The Woodacre Station has three of these units; the Point Reyes Station has one. These units are available to address any fire suppression needs generated by the proposed project. Airborne water delivery systems, such as helicopters and fixed-wing aircraft are also available if needed. As such, MCFD has sufficient resources to handle the needs for water delivery to the project

site for fire suppression, if required.

As discussed in Section 4.8, Transportation and Circulation, the project would be consistent with MCFD access requirements for emergency vehicles and firefighting equipment. Details for traffic management are also reviewed in Section 4.8.

The demand for adequate water for fire suppression would be met by self-contained firefighting units without need of water mains or fire hydrants. In addition, adequate traffic management would be implemented to ensure adequate fire and emergency access. Therefore, impacts to fire protection and emergency medical services are considered less than significant.

(2) Police Protection. Implementation of the proposed project would rehabilitate SFBD within the project area. Roadway improvements, including the closure of areas currently used for pullouts and the improvement of three new properly designed pull outs should reduce the risk of vehicle, bicyclist, and pedestrian accidents in the project area, thereby marginally reducing the number of police calls. Therefore, the long-term impact of the proposed project on police services is expected to be beneficial.

"No Parking" signs would be posted along the three new pull outs to be constructed as part of the proposed project. According to the Marin County Sheriff's Office, these new pullouts would require no additional law enforcement resources to patrol.

The proposed project is short-term in nature (approximately 9 months) and involves the rehabilitation of the existing roadway. Given the duration of the project and the fact that the project entails rehabilitating an existing roadway, implementation of the project is not expected to require extensive police response. It is anticipated that the MCSO has sufficient resources to supply the proposed project. Construction projects similar to the proposed project are not significant generators of crime and/or the need for police response or services. Implementation of the proposed project is not expected to require new or expanded policies facilities, staffing or equipment to serve the proposed project. Therefore, this impact is considered less than significant.

(3) Schools. The proposed project entails rehabilitating the existing roadway and would not generate additional permanent employees or residents in the vicinity of the project site. Construction of residential structures is not proposed as part of the project, and as such, the project would not lead to an increase in population in the local area, or an increase in student population in the project area. The proposed project is short-term in nature; therefore, it would not indirectly affect local school as a result of employees moving into the area to work on the proposed project.

No school bus routes or supplemental school service routes operated by Marin Transit traverse the project site. Therefore, implementation of proposed roadway improvements would have no impact on students getting to/from local schools. Therefore, impacts to schools are considered less than significant.

(4) Parks and Recreation. The proposed project would not result in population growth or the associated increased use of recreational facilities. As described above, the project site is surrounded by recreational land uses, including Samuel P. Taylor State Park and the GGNRA. SFDB constitutes the primary access route to these recreational facilities. Construction activities associated with

implementation of the proposed project could create temporary delays for visitors accessing adjacent recreation facilities, including Samuel P. Taylor State Park. Such impacts would be short-term in duration and would be minimized with appropriate traffic management during the construction period (see Section 4.8, Traffic and Circulation). Overall, implementation of the proposed roadway improvements would enhance the safety of the existing roadway, thereby creating a beneficial impact for recreation users trying to access adjacent parks and recreation facilities. Therefore, impacts to parks and recreation are considered less than significant.

(5) Water Supply. The project entails rehabilitation of the existing roadway. Potable water is not currently supplied along the roadway alignment and would not be supplied after project completion.

Construction activities would use water to wet the exposed ground surface and demolished roadway materials (asphalt and concrete) during preparation of the roadbed, and would be applied to any other exposed materials that could produce dust if blown by the wind. As described in Section 4.8, Traffic and Circulation, water trucks would obtain loads of water from a local private source in either Olema or Pt. Reyes Station. No water would be supplied by Samuel P. Taylor State Park. Water obtained from the private source is not anticipated to be in a large enough quantity to significantly affect any local aquifers or water systems.

Potable water would also be required for drinking purposes by construction personnel. Any water used for this purpose would be brought to the project site in closed containers from the contractors work yard, and no potable water for these purposes would be obtained from the local area.

Therefore, project impacts on water supply are considered less than significant.

(6) Solid Waste. Implementation of the proposed project would generate solid waste associated with construction activities. The extent of solid waste resulting from project construction is shown in Table 4.11.A. The majority of solid waste generated by the proposed project would be recycled, either on site or at other locations within the County. However, it is probable that a small amount of solid waste from construction of the proposed project would need to be disposed of at the Redwood Landfill in Novato. The quantity of these generated solid waste materials would be expected to be small, and wastes would be transported to the Redwood Landfill by the construction subcontractor.

The Redwood Landfill currently has the capacity to accept approximately 1,010 tons of solid waste materials beyond the current average amount that it receives on a daily basis. Therefore, the landfill has more than an adequate capacity to accept solid waste materials from the proposed project. As such, the project's impact on solid waste collection and disposal services would represent a less than significant impact.

Table 4.11.A: Solid Waste Resulting from the Proposed Project

Type of Material	Amount
Organic Material	400 cubic yards
Culverts of various sizes	1,300 linear feet
Asphalt Grindings	550 cubic yards
Soil	9,000 cubic yards

Source: BKF Engineers, 2010

Impact PS-1: **Construction of the proposed project would generate waste water and human waste that if not disposed of at the proper facilities, could pose a public health impact. (S)**

Construction personnel would produce wastewater during implementation of the proposed project. Restroom and washroom facilities currently available in the project vicinity are located at Camp Taylor at Samuel P. Taylor State Park; no restrooms are located within the immediate project area. These facilities are for the use for park visitors, and would not be used on a regular basis by construction personnel during project construction, unless required. Park facilities currently have adequate capacity to handle additional wastewater production should construction personnel be required to use them, and impacts would be considered less than significant.

The project contractors, as a standard best management practice, will provide portable restroom facilities and wash areas for construction personnel. However, if such facilities develop a leak during use, or if wastewater materials are released during removal of these materials by the company providing the portable facilities, materials could be released into sensitive habitat areas or could contaminate Lagunitas Creek or other waterways, thus leading to human health concerns and impacts.

> Mitigation Measure PS-1a: In accordance with Mitigation Measure HYD-1, portable restroom and washroom facilities shall be located 50 feet away from drain inlets to prevent accidental release of wastewater materials into these areas. A qualified biologist shall be consulted on location of such facilities prior to their placement.
>
> Mitigation Measure PS-1b: Portable restroom and washroom facilities shall have secondary containment placed around them in order to contain wastewater materials in the event that a leak or accidental release should occur.
>
> Mitigation Measure PS-1c: Portable restroom and wastewater facilities shall be monitored, maintained, and emptied on a regular basis to ensure that the facilities continue to function properly.

Significance After Implementation. Implementation of Mitigation Measure PS-1a through PS-1c would ensure that no wastewater materials would leak or accidentally be released to any sensitive habitat areas or streams, ensuring that no impacts to sensitive wildlife resources or humans would occur. Implementation of the recommended mitigation measures would reduce wastewater impacts to a ***less than significant*** level.

4.12 GLOBAL CLIMATE CHANGE

This section includes a discussion of global climate change, its causes and the contribution of human activities, as well as a summary of existing greenhouse gas (GHG) emissions. The section describes the criteria for determining the significance of climate change impacts, and estimates the likely GHG emissions that would result from construction activities, vehicular traffic, energy consumption and other emission sources. Where appropriate, mitigation measures are recommended to reduce project-related impacts to a less-than-significant level.

4.12.1 Setting

The following discussion provides an overview of the geographical and climate setting of Marin County, as well as global climate change, its causes, and its potential effects; and emission sources and inventories.

Description of Global Climate Change and its Sources. Global climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other significant changes in climate (such as precipitation or wind) that last for an extended period of time. The term "global climate change" is often used interchangeably with the term "global warming," but "global climate change" is preferred to "global warming" because it helps convey that there are other changes in addition to rising temperatures.

Climate change refers to any change in measures of weather (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from natural factors, such as changes in the sun's intensity; natural processes within the climate system, such as changes in ocean circulation; or human activities, such as the burning of fossil fuels, land clearing, or agriculture. The primary observed effect of global climate change has been a rise in the average global tropospheric[190] temperature of 0.36°F per decade, determined from meteorological measurements worldwide between 1990 and 2005. Climate change modeling shows that further warming could occur, which would induce additional changes in the global climate system during the current century. Changes to the global climate system, ecosystems, and the environment of California could include higher sea levels, drier or wetter weather, changes in ocean salinity, changes in wind patterns or more energetic aspects of extreme weather, including droughts, heavy precipitation, heat waves, extreme cold and increased intensity of tropical cyclones. Specific effects in California might include a decline in the Sierra Nevada snowpack, erosion of California's coastline, and seawater intrusion in the Delta.

Global surface temperatures have risen by 1.33°F ± 0.32°F over the last 100 years (1906 to 2005). The rate of warming over the last 50 years is almost double that over the last 100 years.[191] The latest projections, based on state-of-the art climate models, indicate that temperatures in California are expected to rise 3 to 10.5°F by the end of the century.[192] The prevailing scientific opinion on climate change is that most of the warming observed over the last 50 years is attributable to human activities.

[190] The troposphere is the zone of the atmosphere characterized by water vapor, weather, winds, and decreasing temperature with increasing altitude.
[191] Intergovernmental Panel on Climate Change (IPCC), 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC.*
[192] California Climate Change Center, 2006. *Our Changing Climate. Assessing the Risks to California.* July.

Increased amounts of carbon dioxide (CO_2) and other GHGs are the primary causes of the human-induced component of warming. The observed warming effect associated with the presence of GHGs in the atmosphere (from either natural or human sources) is often referred to as the greenhouse effect.[193]

GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are:[194]

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF_6)

Over the last 200 years, human activities have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere, and enhancing the natural greenhouse effect, which is believed to be causing global warming. While GHGs produced by human activities include naturally-occurring GHGs such as CO_2, methane, and N_2O, some gases, like HFCs, PFCs, and SF_6 are completely new to the atmosphere. Certain other gases, such as water vapor, are short-lived in the atmosphere as compared to these GHGs that remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is generally excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation. For the purposes of this EIR, the term "GHGs" will refer collectively to the six gases identified in the bulleted list provided above.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The global warming potential is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to CO_2, the most abundant GHG. The definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2eq). Table 4.12.A shows the GWPs for each type of GHG. For example, sulfur hexafluoride is 22,800 times more potent at contributing to global warming than carbon dioxide.

[193] The temperature on Earth is regulated by a system commonly known as the "greenhouse effect." Just as the glass in a greenhouse lets heat from sunlight in and reduce the amount of heat that escapes, greenhouse gases like carbon dioxide, methane, and nitrous oxide in the atmosphere keep the Earth at a relatively even temperature. Without the greenhouse effect, the Earth would be a frozen globe; thus, although an excess of greenhouse gas results in global warming, the *naturally occurring* greenhouse effect is necessary to keep our planet at a comfortable temperature.

[194] The greenhouse gases listed are consistent with the definition in Assembly Bill (AB) 32 (Government Code 38505), as discussed later in this section.

The following discussion summarizes the characteristics of the six primary GHGs.

Table 4.12.A: Global Warming Potential of Greenhouse Gases

Gas	Atmospheric Lifetime (Years)	Global Warming Potential (100-year Time Horizon)
Carbon Dioxide	50-200	1
Methane	12	25
Nitrous Oxide	114	298
HFC-23	270	14,800
HFC-134a	14	1,430
HFC-152a	1.4	124
PFC: Tetrafluoromethane (CF_4)	50,000	7,390
PFC: Hexafluoromethane (C_2F_6)	10,000	12,200
Sulfur Hexafluoride (SF_6)	3,200	22,800

Source: IPCC, 2007. *Climate Change 2007: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the IPCC.

Carbon Dioxide (CO_2). In the atmosphere, carbon generally exists in its oxidized form, as CO_2. Natural sources of CO_2 include the respiration (breathing) of humans, animals and plants, volcanic outgassing, decomposition of organic matter and evaporation from the oceans. Human-caused sources of CO_2 include the combustion of fossil fuels and wood, waste incineration, mineral production, and deforestation. The Earth maintains a natural carbon balance and when concentrations of CO_2 are upset, the system gradually returns to its natural state through natural processes. Natural changes to the carbon cycle work slowly, especially compared to the rapid rate at which humans are adding CO_2 to the atmosphere. Natural removal processes, such as photosynthesis by land- and ocean-dwelling plant species, cannot keep pace with this extra input of man-made CO_2, and consequently, the gas is building up in the atmosphere. The concentration of CO_2 in the atmosphere has risen about 30 percent since the late 1800s.[195]

In 2002, CO_2 emissions from fossil fuel combustion accounted for approximately 98 percent of man-made CO_2 emissions and approximately 84 percent of California's overall GHG emissions (CO_2eq). The transportation sector accounted for California's largest portion of CO_2 emissions, with gasoline consumption making up the greatest portion of these emissions. Electricity generation was California's second largest category of GHG emissions.

Methane (CH_4). Methane is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources include wetlands, termites, and oceans. Anthropogenic sources include rice cultivation, livestock, landfills and waste treatment, biomass burning, and fossil fuel combustion (burning of coal, oil, natural gas, etc.). Decomposition occurring in landfills accounts for the majority of human-generated CH_4 emissions in California, followed by enteric fermentation (emissions from the digestive processes of livestock).[196] Agricultural processes such as manure management and rice cultivation are also significant sources of manmade CH_4 in California. Methane accounted for approximately 6 percent of gross climate change emissions (CO_2eq) in California in

[195] California Environmental Protection Agency. 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. March.

[196] California Air Resources Board, Greenhouse Gas Inventory Data - 1990 to 2004. http://www.arb.ca.gov/cc/inventory/data/data.htm. Accessed November 2008.

2002.[197] It is estimated that over 60 percent of global methane emissions are related to human-related activities.[198] As with CO_2, the major removal process of atmospheric methane – a chemical breakdown in the atmosphere – cannot keep pace with source emissions, and methane concentrations in the atmosphere are increasing.

Nitrous Oxide (N_2O). Nitrous oxide is produced naturally by a wide variety of biological sources, particularly microbial action in soils and water. Tropical soils and oceans account for the majority of natural source emissions. Nitrous oxide is a product of the reaction that occurs between nitrogen and oxygen during fuel combustion. Both mobile and stationary combustion emit N_2O, and the quantity emitted varies according to the type of fuel, technology, and pollution control device used, as well as maintenance and operating practices. Agricultural soil management and fossil fuel combustion are the primary sources of human-generated N_2O emissions in California. Nitrous oxide emissions accounted for nearly 7 percent of man-made GHG emissions (CO_2eq) in California in 2002.

Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur Hexafluoride (SF_6). HFCs are primarily used as substitutes for ozone-depleting substances regulated under the Montreal Protocol.[199] PFCs and SF_6 are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. There is no aluminum or magnesium production in California; however, the rapid growth in the semiconductor industry, which is active in California, leads to greater use of PFCs. HFCs, PFCs, and SF_6 accounted for about 3.5 percent of man-made GHG emissions (CO_2eq) in California in 2002.[200]

Emissions Sources and Inventories. An emissions inventory that identifies and quantifies the primary human-generated sources and sinks of GHGs is a well-recognized and useful tool for addressing climate change. This section summarizes the latest information on global, United States, California, and local GHG emission inventories. However, because GHGs persist for a long time in the atmosphere (see Table 4-14.A), accumulate over time, and are generally well-mixed, their impact on the atmosphere and climate cannot be tied to a specific point of emission.

Global Emissions. Worldwide emissions of GHGs in 2004 were 27 billion metric tons of CO_2eq per year.[201] Global estimates are based on country inventories developed as part of programs of the United Nations Framework Convention on Climate Change (UNFCCC).

U.S. Emissions. In 2004, the United States emitted about 7.3 billion metric tons of CO_2eq or about 25 tons per year per person. Of the four major sectors nationwide – residential, commercial, industrial and transportation – transportation accounts for the highest amount of GHG emissions (approximately

197 Ibid.

198 IPCC, 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC.

199 The Montreal Protocol is an international treaty that was approved on January 1, 1989, and was designated to protect the ozone layer by phasing out the production of several groups of halogenated hydrocarbons believed to be responsible for ozone depletion.

200 California Environmental Protection Agency. 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. March.

201 Combined total of Annex I and Non-Annex I Country CO_2eq emissions. United Nations Framework Convention on Climate Change (UNFCCC), 2007. *Greenhouse Gas Inventory Data.* Information available at http://unfccc.int/ghg_data/ghg_data_unfccc/time_series_annex_i/items/3814.php and http://maindb.unfccc.int/library/view_pdf.pl?url=http://unfccc.int/resource/docs/2005/sbi/eng/18a02.pdf.

35 to 40 percent); these emissions are entirely generated from direct fossil fuel combustion. Between 1990 and 2006, total U.S. GHG emissions rose approximately 14.7 percent.[202]

State of California Emissions. According to California ARB emission inventory estimates, California emitted approximately 480 million metric tons[203] of CO_2eq emissions in 2004.[204] This large number is due primarily to the sheer size of California compared to other States. By contrast, California has the fourth lowest per-capita carbon dioxide emission rate from fossil fuel combustion in the country, due to the success of its energy efficiency and renewable energy programs and commitments that have lowered the State's GHG emissions rate of growth by more than half of what it would have been otherwise.[205]

The Cal/EPA Climate Action Team stated in its March 2006 report that the composition of gross climate change pollutant emissions in California in 2002 (expressed in terms of CO_2eq) was as follows:

- CO_2 accounted for 83.3 percent;
- CH_4 accounted for 6.4 percent;
- N_2O accounted for 6.8 percent; and
- HFCs, PFC, and SF_6 accounted for 3.5 percent.[206]

The California ARB estimates that transportation is the source of approximately 38 percent of the State's GHG emissions in 2004, followed by electricity generation (both in-State and out-of-State) at 23 percent, and industrial sources at 20 percent. The remaining sources of GHG emissions are residential and commercial activities at 9 percent, agriculture at 6 percent, high global warming potential gases at 3 percent, and recycling and waste at 1 percent.[207]

The California ARB is responsible for developing the California Greenhouse Gas Emission Inventory. This inventory estimates the amount of GHGs emitted to and removed from the atmosphere by human activities within the State of California and supports the AB 32 Climate Change Program. The California ARB's current GHG emission inventory covers the years 1990-2004 and is based on fuel use, equipment activity, industrial processes, and other relevant data (e.g., housing, landfill activity, agricultural lands). The emission inventory estimates are based on the actual amount of all fuels combusted in the State, which accounts for over 85 percent of the GHG emissions within California.

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202 U.S. Environmental Protection Agency (EPA). 2008. The U.S. Greenhouse Gas Emissions and Sinks: Fast Facts. http://www.epa.gov/climatechange/emissions/downloads/2008_GHG_Fast_Facts.pdf.

203 A metric ton is equivalent to approximately 1.1 tons.

204 California Air Resources Board, Greenhouse Gas Inventory Data - 1990 to 2004. http://www.arb.ca.gov/cc/inventory/data/data.htm. Accessed November 2008.

205 California Energy Commission (CEC), 2007. Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 - Final Staff Report, publication # CEC-600-2006-013-SF, Sacramento, CA, December 22, 2006; and January 23, 2007 update to that report.

206 California Environmental Protection Agency. 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. March.

207 California Air Resources Board (ARB), 2008. http://www.climatechange.ca.gov/inventory/index.html. September.

The California ARB staff has projected statewide unregulated GHG emissions for the year 2020, which represent the emissions that would be expected to occur in the absence of any GHG reduction actions, will be 596 million metric tons (MMT) of CO_2eq. GHG emissions from the transportation and electricity sectors as a whole are expected to increase, but remain at approximately 38 percent and 23 percent of total CO_2eq emissions, respectively. The industrial sector consists of large stationary sources of GHG emissions and the percentage of the total 2020 emissions is projected to be 17 percent of total CO_2eq emissions. The remaining sources of GHG emissions in 2020 are high global warming potential gases at 8 percent, residential and commercial activities at 8 percent, agriculture at 5 percent, and recycling and waste at 1 percent.[208]

Marin County Emissions. Marin County developed a Greenhouse Gas Reduction Plan in 2006 which documents existing GHGs in the County and develops strategies to reduce GHG emissions. The GHGs analyzed in Marin County's GHG emissions inventory include CO_2, CH_4, N_2O, and various hydrofluorocarbons. All emission levels are reported in CO_2eq units. An inventory of 1990 GHG emissions totals countywide levels at approximately 2.6 million tons of CO_2eq. Overall, Marin County experienced a 15 percent increase in GHG emissions from 1990 to 2000.[209]

4.12.2 Regulatory Framework

The regulatory framework and other governmental activities addressing GHG emissions and global climate change are discussed in this section.

Background. Over a decade ago, most countries joined an international treaty, the UNFCCC, to begin to consider what can be done to reduce global warming and to cope with the physical and socioeconomic effects of climate change. More recently, a number of nations have ratified an amendment to the treaty: the Kyoto Protocol. The goal of the Kyoto Protocol is to achieve overall emissions reduction targets for six GHGs regulated under the Protocol (CO_2, CH_4, N_2O, HFCs, PFC, and SF_6) by 2012. As of November 2009, over 180 countries have ratified the Kyoto Protocol. Industrialized and developing nations have different requirements for GHG reductions. Each nation must reduce GHG emissions by a certain percentage below 1990 levels (e.g., 8 percent reduction for the European Union, 6 percent reduction for Japan). The average reduction target for nations participating in the Kyoto Protocol is approximately 5 percent below 1990 levels. The United States has not ratified the Kyoto Protocol.

In February 2002, the United States government announced a comprehensive strategy to reduce the GHG intensity[210] of the American economy by 18 percent over the 10-year period from 2002 to 2012. This strategy has three basic components: (1) slowing the growth of emissions, (2) strengthening science, technology and institutions, and (3) enhancing international cooperation.[211] The federal multi-agency programs for Climate Change Science and Climate Change Technology were established to investigate natural and human-induced changes in the Earth's global environmental system; to monitor, understand, and predict global change; to provide a sound scientific basis for national and international decision-making and to accelerate the development and deployment of key

208 California Air Resources Board (ARB), 2008. http://www.arb.ca.gov/cc/inventory/data/forecast.htm. September.
209 County of Marin, 2006. *Greenhouse Gas Reduction Plan*. October.
210 GHG intensity measures the ratio of GHG emissions to economic output.
211 U.S. EPA. 2008. Climate Change: Basic Information. www.epa.gov/climatechange/basicinfo.html.

technologies to reduce GHG emissions. The U.S. EPA plays a role within the Climate Change Science Program by evaluating the potential consequences of climate variability and the effects on air quality, water quality, ecosystems, and human health in the United States.

Federal Regulations. Currently there are no adopted federal regulations to control global climate change or GHG emissions. However, recent court cases may change the voluntary approach to address global climate change and GHG emissions. On April 2, 2007, the United States Supreme Court ruled that the U.S. EPA has the authority to regulate CO_2 emissions under the federal Clean Air Act (CAA). The U.S. EPA is currently undertaking the rulemaking process that would establish GHG emissions from vehicles. On September 15, 2009, U.S. EPA and the Department of Transportation's National Highway Safety Administration proposed a national program that would reduce GHG emissions and improve fuel economy for new cars and trucks sold in the United States.[212]

State Regulations. In a response to the transportation sector's significant contribution to California's CO_2 emissions, California adopted GHG emissions standards for passenger vehicles and light duty trucks in September 2004. When fully phased-in, the near-term (2009 to 2012) standards would reduce GHG emissions by approximately 22 percent compared to the emissions from the 2002 fleet, while the midterm (2013 to 2016) standards would result in a reduction of approximately 30 percent. To set its own GHG emissions limits on motor vehicles, California was required to receive a waiver from the U.S. EPA. On June 30, 2009, U.S. EPA granted the waiver of CAA preemption to California for its GHG emission standards for motor vehicles beginning with the 2009 model year.

In June 2005, Governor Schwarzenegger established California's GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals for the State of California: GHG emissions should be reduced to 2000 levels by 2010; GHG emissions should be reduced to 1990 levels by 2020; and GHG emissions should be reduced to 80 percent below 1990 levels by 2050.

On August 31, 2006, the California State legislature passed Assembly Bill 32 (AB 32), the "Global Warming Solutions Act," which aims at reducing GHG emissions to 1990 levels by 2020. The California ARB has established the level of GHG emissions in 1990 at 427 MMT of CO_2eq. The emissions target of 427 MMT requires the reduction of 169 MMT from the State's projected business-as-usual 2020 emissions of 596 MMT. Pursuant to the requirements of AB 32, the California ARB has prepared and approved a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline for reducing GHGs that contribute to global climate change. The Scoping Plan includes measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures.[213] The reduction actions may include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. The Scoping Plan, even after Board approval, remains a recommendation. The measures in the Scoping Plan will not be binding until after they are adopted through the normal rulemaking process. The California ARB rulemaking process includes preparation and release of each of the draft measures, public input through workshops and a public comment period, followed by a California ARB hearing and rule adoption.

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[212] U.S. EPA 2009. *Proposed Rulemaking: Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards.* http://www.epa.gov/oms/climate/regulations.htm

[213] California Air Resources Board. 2008. *Climate Change Proposed Scoping Plan: a framework for change*. October.

AB 32 also directed California ARB and the newly created Climate Action Team (CAT)[214] to identify a list of "discrete early action GHG reduction measures" that can be adopted and made enforceable by January 1, 2010. On January 18, 2007, Governor Schwarzenegger signed Executive Order S-1-07, further solidifying California's dedication to reducing GHGs by setting a new Low Carbon Fuel Standard. The Executive Order sets a target to reduce the carbon intensity of California transportation fuels by at least 10 percent by 2020 and directs California ARB to consider the Low Carbon Fuel Standard as a discrete early action measure.

In June 2007 California ARB approved a list of 37 early action measures, including three discrete early action measures (Low Carbon Fuel Standard, Restrictions on High Global Warming Potential Refrigerants, and Landfill Methane Capture). Discrete early action measures are measures that are required to be adopted as regulations and made effective no later than January 1, 2010, the date established by Health and Safety Code (HSC) Section 38560.5. The California ARB adopted additional early action measures in October 2007 that tripled the number of discrete early action measures. [215] These measures relate to truck efficiency, port electrification, reduction of perfluorocarbons from the semiconductor industry, reduction of propellants in consumer products, proper tire inflation, and SF_6 reductions from the non-electricity sector. The combination of early action measures is estimated to reduce State-wide GHG emissions by nearly 16 MMT.[216]

Senate Bill 375 (SB 375), signed into law on October 1, 2008, is intended to enhance California ARB's ability to reach AB 32 goals by directing California ARB to develop regional GHG emissions reduction targets to be achieved within the automobile and light truck sectors for 2020 and 2035. The California ARB will work with California's 18 metropolitan planning organizations to align their regional transportation, housing, and land use plans and prepare a "Sustainable Communities Strategy" to reduce the number of vehicle miles traveled in their respective regions and demonstrate the region's ability to attain its GHG reduction targets.

To assist public agencies in the mitigation of GHG emissions or analyzing the effects of GHGs under CEQA, including the effects associated with transportation and energy consumption, Senate Bill 97 (Chapter 185, 2007) requires the Governor's Office of Planning and Research (OPR) to develop CEQA guidelines on how to minimize and mitigate a project's GHG emissions. OPR transmitted the recommended amendments to the CEQA Guidelines for GHG emissions to the Natural Resources Agency on April 13, 2009. On July 3, 2009, the Natural Resources Agency commenced the process for certifying and adopting the CEQA amendments. The Natural Resources Agency has revised the text of the proposed amendments based on comments received and closed the public comment period for the proposed revisions on November 10, 2009. The Natural Resources Agency is required to certify and adopt the amendments by January 1, 2010. The proposed amendments encourage lead agencies to consider many factors in performing a CEQA analysis, but preserve the discretion granted by CEQA to lead agencies in making their own determinations.

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[214] CAT is a consortium of representatives from State agencies who have been charged with coordinating and implementing GHG emission reduction programs that fall outside of ARB's jurisdiction.

[215] California Air Resources Board. 2007. *Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration*. October.

[216] California Air Resources Board. 2007. "ARB approves tripling of early action measures required under AB 32". News Release 07-46. http://www.arb.ca.gov/newsrel/nr102507.htm. October 25.

The State's air districts, including the BAAQMD, are proposing specific thresholds for projects and plans, as well as an approach to the GHG analysis that will be consistent with the general CEQA guidelines. The BAAQMD is in the process of updating the CEQA Guidelines. The CEQA Guidelines Update will review, revise, and develop significance thresholds, assessment methodologies, and mitigation strategies for criteria pollutants, air toxics, odors, and GHG emissions. The public hearing for the guidelines will start on November 19, 2009 and continue on December 2, 2009.

Local Policies. In May 1999, the Marin County Board of Supervisors unanimously approved a set of sustainability recommendations. Through these recommendations, the Board of Supervisors committed the County to undertake actions such as public environmental education, improving County operations, and using sustainability as the foundation for the 2007 Marin Countywide Plan. The Marin County Greenhouse Gas Reduction Plan adopted by the Board of Supervisors in October 2006 sets policies to help achieve the County's GHG emissions targets. The target has been set to reduce GHG emissions 15 to 20 percent below 1990 levels by the year 2020 for internal government and 15 percent countywide. This target exceeds the State target for GHG emissions. The Greenhouse Gas Reduction Plan describes measures related to building, transportation, waste, and land use. Many of these actions and measures are supported by policies in the Marin Countywide Plan and some reflect activities that are already underway and could be expanded.

The Marin Countywide Plan includes a target for reducing GHG emissions countywide by 15 percent by 2015 and for County government sources 15 to 20 percent by 2015. To achieve these targets the Marin Countywide Plan contains numerous goals, policies and programs that, if adopted and implemented, would act to help minimize carbon dioxide and other GHG emissions. The Atmosphere and Climate section of the Natural Systems and Agriculture Element describes goals, policies and programs with respect to GHGs. These policies and programs are intended to reduce GHG emissions countywide.

The Marin Countywide Plan and the EIR prepared for the Countywide Plan contain a discussion of GCC and GHG emissions in Marin County. The EIR determined that California climate predictions include: average temperature increases of up to 10 degree by the end of the century; sea level rises of 1 to 3 feet; a 35 to 55 percent increase in fire risk; a substantial increase in electricity demand; and a range of health risks.

4.12.3 Significance Criteria

At this time, neither the CEQA statute nor *CEQA Guidelines* prescribe thresholds of significance or a particular methodology for performing an impact analysis; as with most environmental topics, significance criteria are left to the judgment and discretion of the lead agency. Marin County has not formally adopted significance criteria for GHG emissions or the effects of global climate change, but adheres to guidance provided by OPR.

OPR Guidance. In June 2009, OPR recommended an approach for GHG analysis that included the following: (1) identify and quantify GHG emissions, (2) assess the significance of the impact on climate change, and (3) if significant, identify alternatives and/or mitigation measures to reduce the

impact below significance.[217] In April 2009, proposed *CEQA Guideline* amendments released by OPR included the following direction regarding determination of significant impacts from GHG emissions (Section 15064.4):

(a) The determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in section 15064. A lead agency should make a good-faith effort, based on available information, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

> (1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; or
>
> (2) Rely on a qualitative analysis or performance based standards.

(b) A lead agency may consider the following when assessing the significance of impacts from greenhouse gas emissions on the environment:

> (1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting.
>
> (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
>
> (3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such regulations or requirements must be adopted by the relevant public agency through a public review process and must include specific requirements that reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

CEQA Guidelines Section 15064(b) provides that the "determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data," and further, states that an "ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting."

Some policy makers and regulators suggest that a zero emissions threshold would be appropriate when evaluating GHGs and their potential effect on climate change. Such a rule appears inconsistent with the State's approach to mitigation of climate change impacts. AB 32 does not prohibit all new GHG emissions; rather, it requires a reduction in State-wide emissions to a given level. Thus, AB 32

[217] California, State of, 2008. Governor's Office of Planning and Research. *CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review*. June 19.

recognizes that GHG emissions will continue to occur; increases will result from certain activities, but reductions must occur elsewhere.

Individual projects incrementally contribute toward the potential for global climate change on a cumulative basis in concert with all other past, present, and probable future projects. While individual projects are unlikely to measurably affect global climate change, each of these projects incrementally contribute toward the potential for global climate change on a cumulative basis, in concert with all other past, present, and probable future projects.

BAAQMD Guidance. The BAAQMD is in the process of identifying and adopting a recommended approach for determining the significance threshold for GHG emissions. As noted previously, the BAAQMD is currently conducting hearings on the significance thresholds, assessment methodologies, and mitigation strategies for GHG emissions. The BAAQMD's draft guidelines suggest that the threshold of significance for construction-related GHG emissions, which are the primary concern for the SFDB Rehabilitation Project, is the presence of the following performance-based best management practices, as applicable:

- Alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet;
- Local building materials (within 100 miles) of at least 10 percent; and
- Recycle at least 50 percent of construction waste or demolition materials.

Significance Criteria. This EIR analyzes whether the project's GHG emissions would be cumulatively significant. Accordingly, the project would result in significant adverse impacts on global climate change if it would:

- Not implement BAAQMD-recommended best management practices for construction;
- Result in significant adverse physical impacts as a result of increases in greenhouse gases; and
- Substantially conflict with or obstruct the implementation of GHG emissions reduction goals under AB 32 or other State regulations

4.12.4 Impacts and Mitigation Measures

A discussion of the project's impacts on global climate change follows. GHG emissions associated with the project would occur over the short term from construction activities, primarily emissions from equipment exhaust.

Less than Significant Impacts. The following less-than-significant impacts could result from implementation of the proposed project.

(1) Long-Term GHG Emissions. The proposed project would rehabilitate roadway to improve the deteriorated pavement that has exceeded its design life. The project would also improve the roadway's alignment to enhance safety in addition to improving conditions for bicycle and pedestrian uses of the roadway. This is a rehabilitation project that once completed, would not result in increased GHG emissions because the project would not increase vehicle trips or vehicle miles traveled on the roadway. The rehabilitation would make the sections of roadway safer for motorist and enhance

conditions for pedestrians and bicyclists which could contribute to an overall reduction in GHG emissions associated with the use of the roadway. Therefore, no new regional vehicle emissions would occur and the impact is deemed less-than-significant.

(2) Consistency with plans and policies related to greenhouse gases. Because the project would not create new regional vehicle or other long-term GHG emissions it would not conflict with any plan or policy intended to reduce long-term GHG emissions, including AB 32 and SB 375, which require planning agencies to develop strategies for meeting GHG emission targets as part of regional transportation plans, and the Marin Countywide Plan. The project would provide rehabilitated pavement to make the sections of roadway safer for motorist, but would also enhance conditions for pedestrians and bicyclists which could contribute to an overall reduction in GHG emissions associated with the use of the roadway. Based on the project's consistency with State and County policies, the project would result in a less-than-significant impact on greenhouse gas emissions.

Significant Impacts. The proposed project would result in the following potentially significant global climate change impact.

IMPACT GCC-1: Construction of the proposed project could generate substantial GHG emissions. (S)

GHG emission estimates related to construction of the proposed project are discussed below and are provided for informational purposes. This analysis is based on methodologies and information available to the County at the time this document was prepared. Just as construction activities would result in the emission of criteria pollutants, the combustion of fossil-based fuels from equipment exhaust, construction related vehicular activity and construction worker automobile trips creates GHG emissions primarily in the form of CO_2. GHG emission levels for construction activities vary depending on the number and type of equipment, duration of use, operation schedules, and the number of construction workers. Exhaust emissions from construction activities envisioned on site would vary daily as construction activity levels change.

The proposed project is under the jurisdiction of the BAAQMD, which has not adopted a recommended approach for evaluating GHG emissions or air pollutants from the construction of roadway projects; however, draft guidance recommends implementation of best management practices and emission quantification. The Sacramento Metropolitan Air Quality Management District (SMAQMD) has developed the Road Construction Emissions Model, which quantifies roadway construction project air emissions over the entire construction period. The methodology used to estimate emissions is based on estimated construction operations by vehicle type and equipment emission factors developed by the California ARB.

During project construction heavy equipment would be used to grind asphalt from the existing concrete slab and additional equipment would be required for paving the roadway. Model calculations consider the additional emissions generated by haul trucks used to transport the excavated material. The model inputs include a construction start date of 2010 and a construction duration period of 9 months. Model results indicate that the estimated total project construction emissions would be approximately 436.3 metric tons or (0.436 MMT) of CO_2. The model worksheets, including inputs and assumptions, are included in Appendix G.

Chapter 3.0, Project Description, of this EIR lists several Best Management Practices that would be implemented during construction. Those practices do not include the BAAQMD recommended measures; therefore, GHG emissions generated during construction of the proposed project would be considered significant.

> Mitigation Measure GCC-1: Consistent with draft guidance from the BAAQMD, the following best management practices shall be required of construction contracts and specifications for the project.
>
> - Alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet, as feasible;
> - Local building materials (within 100 miles) of at least 10 percent; and
> - Recycle at least 50 percent of construction waste or demolition materials.

Significance After Implementation. Implementation of Mitigation Measure GCC-1 would reduce the incremental increase in greenhouse gas emissions from project construction activities to a ***less-than-significant*** level.

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CHAPTER 5.0
ALTERNATIVES ANALYSIS

The *CEQA Guidelines* require the analysis of a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the project's basic objectives and avoid or substantially lessen any of the significant effects of the project. The range of alternatives required in an EIR is governed by the "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice.[218] CEQA states that an EIR should not consider alternatives "whose effects cannot be ascertained and whose implementation is remote and speculative."

This chapter describes the alternatives to the project, evaluates the significant environmental impacts associated with each alternative relative to those resulting from the proposed project, and discusses the ability of each alternative to meet the project objectives. A discussion of the environmentally superior alternative is also included in this chapter as required by CEQA.

The following objectives were initially listed in Chapter 3.0, Project Description, of this ~~Draft~~ EIR and are repeated here to help inform the evaluation of alternatives.

- To restore the roadway pavement to provide an additional 30-year design life;
- To improve the roadway alignment, where possible, to enhance safety;
- To protect environmental resources, to the greatest extent possible, during and after construction; and
- To enhance pedestrian and bicycle uses of the roadway.

The proposed project has been described and analyzed in the previous chapters with an emphasis on significant impacts resulting from the proposed project, and mitigation measures have been recommended to reduce or avoid these impacts. The following discussion is intended to inform the public and decision-makers of the relative impacts of three potentially feasible alternatives to the proposed project. The three alternatives to the proposed project discussed in this chapter include the following:

- The **No Project Alternative** assumes that the proposed roadway improvements would not be implemented. Existing traffic and roadway conditions would persist. The County would continue to maintain and repair the roadway on an as needed and ad hoc basis. The roadway design life would not be extended and safety would not be enhanced. Although some impacts associated with construction would be reduced or avoided by the smaller scale repairs of the roadway under the No Project Alternative, the environmental benefits of the project, such as slope stabilization measures to reduce erosion and slope failures and the drainage improvements to reduce the

[218] *CEQA Guidelines,* 2009, Section 15126.6

volume of sediments and pollutants entering Lagunitas Creek, would not be recognized. In general, the No Project Alternative would not achieve the project objectives.

- The **Resurface Roadway Alternative** assumes that the roadway would be restored using the same pavement rehabilitation techniques described in Section 3.4.1 for the proposed project. The existing base course would be crushed, replaced and overlaid with two layers of asphalt concrete. The roadway would not be expanded to accommodate wider lanes or shoulders. No new formal pullouts or retaining walls would be constructed, existing locations along the roadway used as informal pullouts would not be closed, culverts would not be replaced, and slide repair would not be conducted under this alternative. The Resurface Roadway Alternative would partly achieve the project objectives. Under the Resurface Roadway Alternative, one of the environmental benefits of the Proposed Project – slope stabilization measures to reduce erosion and slope failures and the drainage improvements to reduce the volume of sediments and pollutants entering Lagunitas Creek – would not be achieved. The alternative would partially fulfill 'extend life of road' objective. It would extend the design life of the roadway to 20 years but would not provide the additional 30-year design life of the project.
- The **Mitigated Roadway Alternative** assumes that the roadway design would be modified to minimize impacts to site resources. The roadway would be rehabilitated and some sections of the alignment would be widened to accommodate wider vehicle lanes and/or shoulders. Under the Mitigated Roadway Alternative, Option A would be eliminated to minimize the number of trees to be removed. The Mitigated Roadway Alternative would achieve all objectives of the proposed project.

Following is a discussion of each alternative and an analysis of the anticipated environmental impacts of each alternative. This analysis compares the anticipated impacts of each alternative to the impacts associated with the proposed project; the discussion includes a determination as to whether or not each alternative would reduce, eliminate, or create new significant impacts.

5.1 NO PROJECT ALTERNATIVE

5.1.1 Principal Characteristics

Under the No Project Alternative, the existing conditions of the project site would remain. Proposed roadway improvements would not be constructed and existing traffic and roadway conditions would persist. As described in Chapter 3.0, Project Description, the existing road has extensive structural failure including longitudinal and transverse cracks, shattered slab, and fractured pavement that has allowed aggregate to be dislodged and washed into receiving waters. Under the No Project Alternative, the road would continue to degrade, as it has over the past 80 years, and periodic repair and maintenance of the roadway would be performed by the County. Prior maintenance has included removal and replacement of damaged sections of roadway and overlays of asphalt concrete.

While this alternative avoids the majority of the impacts that would result from implementation of the proposed project, some of the project's environmental benefits would not be achieved as well. The benefits of drainage improvements that would reduce the volume of sediments and pollutants entering Lagunitas Creek would not be achieved. Erosion and slope failures may worsen if slope stabilization measures are not implemented. The No Project Alternative would not provide a long-term solution for rehabilitating damaged sections of the roadway or improve the safety of the roadway alignment.

5.1.2 Analysis of the No Project Alternative

The No Project Alternative is evaluated for all environmental topics analyzed in this ~~Draft~~ EIR.

Land Use and Planning Policy. The No Project Alternative would result in no land use changes to the project area. The project area would continue to contain the roadway, open space, ranching and residential uses consistent with the land use designation outlined in the Marin CWP. The alternative would not result in significant conflicts with the numerous CWP policies adopted for the purposes of environmental protection, including policies related to the preservation of drainages, wetlands, and native trees.

Aesthetics. Implementation of the No Project Alternative would result in no roadway construction in the project area with the exception of periodic maintenance to repair damaged sections of the roadway. The No Project Alternative would not change existing land uses on the project site or alter the visual character of the area because trees would not need to be removed and retaining walls would not be installed. Under the alternative, the vegetation and trees in the project area would remain intact. Under the No Project Alternative, the project area would not benefit from the closure of unofficial pullouts that would improve views by eliminating parked cars from the roadway.

Biological Resources. The alternative, which would maintain existing landscape features in the project area, would avoid the significant impacts of the project on biological resources. The No Project Alternative would retain sensitive plant and animal communities and would not diminish the habitat of protected plant and animal species, including redwoods and other native trees. Under the No Project Alternative, the project area would not benefit from drainage improvements, roadway stabilization, and slope repair that would reduce the volume of deteriorating asphalt, sediment, and roadway pollutants entering Lagunitas Creek. The roadway would continue to deteriorate, allowing asphalt and other roadway material to be dislodged and washed into receiving waters.

Under the No Project Alternative, spawning, rearing and feeding habitat for federal and state listed salmonids in Lagunitas Creek would continue to be adversely affected by fine sediments, metals and other pollutants contained in untreated runoff from the SFDB roadway and shoulder. Continued degradation of existing asphalt roadbed would continue to result in the discharge of asphalt binder and associated metals that are potentially toxic to salmonids and other aquatic organisms. Restoration of overwintering habitat for salmonids (i.e., backwater channels and associated floodplain habitat) along Lagunitas Creek (a limited would not occur as a mitigation action under the proposed project.

Cultural Resources. The No Project Alternative would result in minimal ground disturbance in the project area during periodic maintenance to repair damaged sections of the roadway. Therefore, the alternative is not expected to result in impacts to the historic character of SFDB or to prehistoric or historic archaeological or paleontological resources.

Geology and Soils. Under the No Project Alternative, the project site would continue to be subject to seismic hazards, erosion, landslide, and soil deformation and movement. Under the No Project Alternative, erosion and slope failure along the banks of Lagunitas Creek would not be restored and would likely continue to worsen. In a seismic event, the possibility of roadway failure in existing landslide prone areas would be more likely under the No-Project Alternative.

Hydrology and Water Quality. Implementation of the No Project Alternative would include periodic maintenance activities to repair damaged sections of the roadway. While the repair activities would be of lesser magnitude than the construction activities associated with the proposed project; the No Project Alternative, like the proposed project, would result in some soil erosion and the release of construction-related hazardous materials and the emissions of other pollutants that could degrade water quality. Under the No Project Alternative, drainage improvements, including culvert replacement and slope repair along Lagunitas Creek would not be constructed; therefore, erosion and slope failures along the banks of Lagunitas Creek would likely continue to worsen.

Hazards and Hazardous Materials. The No Project Alternative would result in less ground disturbance and construction in the project area. Therefore, the alternative is expected to result in fewer construction impacts associated with the use and transport of hazardous materials, including fuels, oils, lubricants, asphalt products, other petroleum products, and solvents.

Traffic and Circulation. The No Project Alternative would generate a small number of trips to the project site and create temporary traffic delays and safety concerns during periodic maintenance and repair activities. While the alternative would avoid the transportation-related impacts of the project, it would create periodic disruptions of traffic whenever maintenance and repair activities are performed. Motorists and bicyclists would continue to be exposed to existing distressed pavement conditions.

Air Quality. Implementation of the No Project Alternative would include periodic maintenance activities to repair damaged section of the roadway. These activities would require grading or construction activities and generate a small number of trips to the project site. While the repair activities would be of lesser magnitude than the construction activities proposed as part of the project, the No Project Alternative, like the proposed project, would result in air quality impacts, namely emissions of toxic gases and particulate matter.

Noise. The No Project Alternative would result in less ground disturbance and construction in the project area. Therefore, the alternative is expected to result in fewer construction impacts associated with short-term increases in noise for sensitive receptors in the project area. As described in Section 3.3.6, distressed pavement along this section of SFDB contributes to an increase in road noise, particularly for vehicles traveling above 30 mph. The No-Project Alternative would not provide the benefit of vehicle noise reduction associated with replacing the existing paving with rubberized asphalt concrete (RAC).

Public Services. Because the No Project Alternative would result in only periodic maintenance activities in the project area, it would not increase demand for public services, including police and fire services. Therefore, the alternative would not require the construction of new police and fire department facilities in order to maintain acceptable emergency response times.

Global Climate Change. Implementation of the No Project Alternative would include periodic maintenance activities to repair damaged sections of the roadway. While the repair activities would be of lesser magnitude than the construction activities proposed as part of the project, the No Project Alternative, like the proposed project, would result in global climate change impacts, namely generation of substantial GHG emissions associated with roadway maintenance.

5.2 RESURFACE ROADWAY ALTERNATIVE

5.2.1 Principal Characteristics

Under the Resurface Roadway Alternative, the roadway would be restored using the same pavement rehabilitation techniques described in Section 3.4.1 for the proposed project. The existing base course would be crushed, replaced and overlaid with two layers of asphalt concrete. All pavement rehabilitation work would be conducted within the limits of the existing roadway. Under this alternative, the roadway pavement would not be increased to provide wider vehicle lanes and/or roadway shoulders. No new formal pullouts, retaining walls, culvert replacements or slide repairs would be constructed. The existing roadway geometry would be retained and would not be brought into compliance with current design standards as published by Caltrans and AASHTO. The Resurface Roadway Alternative would extend the design life of the roadway by 20 years within the boundaries of the project area.

The Resurface Roadway Alternative would partly achieve the project objectives. Under the Resurface Roadway Alternative, some environmental benefits of the Proposed Project – slope stabilization measures to reduce erosion and slope failures and drainage improvements to reduce the volume of sediments and pollutants entering Lagunitas Creek – would not be achieved. The alternative would partially fulfill the 'extend life of road' objective. It would extend the design life of the roadway to 20 years but would not provide the 30-year design life of the proposed project. The Resurface Roadway Alternative would improve the condition of the existing roadway pavement for motorists and bicyclists but would not provide the additional benefits to motorists and bicyclists associated with additional paved width and geometric design changes resulting from the proposed project.

5.2.2 Analysis of the Resurface Roadway Alternative

The Resurface Roadway Alternative is evaluated below for all topics analyzed in the EIR with the exception of: land use and planning policy; hazards and hazardous materials; traffic and circulation; air quality; noise; public services; and global climate change. The impacts associated with these excluded topics would be essentially the same as those that would result from implementation of the proposed project.

Aesthetics. Similar to the No Project Alternative, the Resurface Roadway Alternative would not change existing land uses on the project site or alter the visual character of the area because trees would not need to be removed and retaining walls would not be installed. Construction would be conducted entirely within the limits of the existing roadway. Under the alternative, the visual character of the project area would benefit from improvements to the roadway surface associated with replacement of the degraded pavement. However, existing locations used by motorists as unofficial vehicular pullouts would not be closed. Therefore, cars would continue to park along the roadway.

Biological Resources. Under the Resurface Roadway Alternative, construction would be conducted entirely within the limits of the existing roadway. Even so construction-related impacts to sensitive plant and animal communities and their habitats would be similar to the proposed project with the exception of tree removal associated with slope repair and Option A. Grading and earthmoving to rehabilitate the roadway pavement could contribute sediment and other pollutants into Lagunitas Creek thereby affecting the quality of spawning and rearing habitat for salmonids and other aquatic organisms downstream. With implementation of the mitigation measures described in Section 4.3,

Biological Resources, potential impacts to biological resources would be reduced to a less-than-significant level. However, continued use of unofficial pullouts for vehicle parking will continue to be a source of contaminants that will affect local water quality in Lagunitas Creek, and the silting associated with the existing landslide will continue to deteriorate local water quality in the creek. The continued incremental degradation of local water quality in sensitive Lagunitas Creek is a potential significant impact of this alternative that is mitigated by the design of the proposed project.

Under the Resurface Roadway Alternative, spawning, rearing and feeding habitat for federal and state listed salmonids in Lagunitas Creek would continue to be adversely affected by fine sediments and other pollutants contained in untreated runoff from the existing pullouts. Salmonid habitat would also continue to be affected by fine sediments and other contaminants carried in storm water that flows over the roadway into the creek due to the dilapidated condition of existing culverts that would not be replaced. Spawning and rearing habitat would continue to be affected by fine sediments generated from the unremediated eroding bank at Station 270+25 and from the other slides that would be repaired under the proposed project.

Cultural Resources. Under the Resurface Roadway Alternative, ground disturbance would be limited within the existing roadway right-of-way, as no roadway widening would occur, thereby requiring less ground disturbance than the proposed project. Therefore, the alternative is not expected to result in impacts to prehistoric or historic archaeological or paleontological resources. Pavement replacement under the Resurface Roadway Alternative would replace the original portions of the roadway thereby altering the historic character of SFDB. As described in Section 4.4, Cultural Resources, this impact is considered less than significant.

Geology and Soils. Under the Resurface Roadway Alternative, the project site would continue to be subject to seismic hazards, erosion, landslides, and soil deformation and movement. The alternative would not benefit from the slope repair work included in the proposed project; therefore, erosion and slope failure along the banks of Lagunitas Creek would likely continue to worsen and will continue to pose a significant threat to the stability of the roadway and the water quality of Lagunitas Creek. The design of the proposed project would have mitigated these conditions.

Hydrology and Water Quality. Like the proposed project, construction activities and operation of the proposed roadway could generate stormwater runoff that could cause or contribute to a violation of water quality standards or waste discharge requirements or otherwise degrade the water quality of Lagunitas Creek. The Resurface Roadway Alternative would result in fewer construction activities on the site thereby reducing the potential for soil erosion and emissions of other pollutants associated with construction activities. However, drainage improvements, including culvert replacement and slope repair along Lagunitas Creek would not be constructed. Therefore, erosion associated with soil settlement and slope failure would likely continue to worsen and there would be continued incremental degradation of water quality in Lagunitas Creek due to silting and roadway contaminants carried in storm water that now flows over the roadway into the creek due to the dilapidated condition of some existing culverts under the roadway.

5.3 MITIGATED ROADWAY ALTERNATIVE

5.3.1 Principal Characteristics

Under the Mitigated Roadway Alternative, the roadway design would be modified to limit impacts on site resources. The roadway would be restored using the same pavement rehabilitation techniques described in Section 3.4.1 for the proposed project. Sections of the roadway alignment would be widened to accommodate larger vehicle lanes and/or shoulders and to bring the roadway into greater compliance with Caltrans and AASHTO design standards. As compared to the proposed project, the extent of roadway widening would be limited to significantly reduce the need for retaining walls. One retaining wall would be constructed at Station 270+25 as part of the slope repair work. The paved shoulder width would not be uniform, but would continue to vary throughout the alignment. Option A would not be included under the Mitigated Roadway Alternative, thereby, limiting tree removal to those required to be removed for the slope repair work at Station 270+25. Other roadway improvements, including slope repair, culvert replacement and formalizing selected pullouts as described in Section 3.4.1 for the proposed project, would be included in the Mitigated Roadway Alternative.

The Mitigated Roadway Alternative would achieve all of the desired objectives of the proposed project, including the primary objective of restoring the roadway pavement to provide an additional 30-year design life, and would result in fewer environmental impacts than the proposed project because the extent of additional paving along the roadway alignment would be limited.

5.3.2 Analysis of the Mitigated Roadway Alternative

The Mitigated Roadway Alternative is evaluated below for all topics analyzed in the EIR with the exception of: land use and planning policy; hazards and hazardous materials; traffic and circulation; air quality; noise; public services; and global climate change. The impacts associated with these excluded topics would be essentially the same as those that would result from implementation of the proposed project.

Aesthetics. As with the Proposed Project, implementation of the Mitigated Roadway Alternative would result in the removal of eight native trees (5 coast live oaks, 3 redwoods) associated with slope stabilization work at Station 270+25. However, since Option A is not included in this alternative the 9 additional trees slated for removal under Option A would be retained. As described in Section 4.2, the trees that would be removed under the Proposed Project would not significantly change the visual character of the roadway or change the scenic vistas available from the roadway given the abundance of the surrounding forest and other large redwoods that encroach on the roadway. However, the visual impacts of this alternative would be reduced due to the retention of the 9 additional trees that could have been removed under Option A. Like the proposed project, the visual impacts of tree removal for slope repair would be less than significant.

Biological Resources. Like the proposed project, construction activities associated with pavement rehabilitation, roadway widening in selected areas, culvert replacement and slope repair could impact sensitive plant and animal species and their habitats and could contribute sediment and pollutants to Lagunitas Creek, which could degrade aquatic habitat for salmonids and other aquatic species. Direct and indirect impacts to native trees, particularly redwoods, would be reduced under this alternative because fewer trees would be removed and the retaining walls would not be constructed except for

the one wall associated with the landslide repair. Mitigation measures for the Proposed Project, described in Section 4.3, Biological Resources, would also be required under the Mitigated Roadway Alternative to reduce impacts to biological resources and sensitive species habitat to a less-than-significant level.

Cultural Resources. Like the proposed project, ground disturbance associated with construction of the Mitigated Roadway Alternative could affect prehistoric or historic archaeological or paleontological resources. Although the Mitigated Roadway Alternative would result in less tree removal due to the elimination of Option A and the elimination of almost all retaining walls along the roadway; the replacement of existing pavement and removal of existing culverts could affect the historic character of SFDB. Implementation of the mitigation measures described in Section 4.4, Cultural Resources, would be required for the Mitigated Roadway Alternative and would reduce the potential impacts on cultural resources to a less-than-significant level.

Geology and Soils. Under the Mitigated Roadway Alternative, the project site would continue to be subject to seismic hazards, erosion, landslides, and soil deformation and movement. As with the proposed project, the alternative includes plans to repair the slope and roadway instability at Station 270+25 and provide new drainage structures that would promote stability to the subsurface materials and minimize erosion. Geologic mitigation measures required in this EIR for the Proposed Project would also be required for the Mitigated Roadway Alternative and would reduce potential geotechnical impacts to a less-than-significant level.

Hydrology and Water Quality. Like the proposed project, construction activities and operation of the proposed roadway under the Mitigated Roadway Alternative would result in increased stormwater runoff that could cause or contribute to a violation of water quality standards or waste discharge requirements or otherwise degrade the water quality of Lagunitas Creek. The reduction in paved roadway width and the elimination of retaining walls along the project alignment under the Mitigated Roadway Alternative would incrementally reduce the extent of impervious surface added to the project area compared to the Proposed Project, but would still require the implementation of Mitigation Measure HYD-1, described in Section 4.6, Hydrology and Water Quality, to reduce water quality impacts to a less-than-significant level.

As with the Proposed Project, the long-term water quality impacts of the Mitigated Roadway Alternative are considered less than significant, as the roadway improvements under this alternative would reduce the potential for erosion and silting in the project area by replacing culverts and repairing failed slopes.

5.4 ALTERNATIVES CONSIDERED BUT REJECTED FROM FURTHER CONSIDERATION

The following section describes two alternatives to the proposed project that were considered, but were rejected from further consideration for the reason(s) provided.

5.4.1 Off-Site Alternatives

The proposed project is intended to rehabilitate the existing deteriorated roadway conditions along those segment of Sir Francis Drake Boulevard in the project area; accordingly, no off-site alternatives were considered since there is no other existing roadway serving the project area.

5.4.2 On-Site Alternatives

The following on-site alternatives were considered but rejected from further consideration:

- **28-Foot Wide Roadway Alternative.** Under the 28-Foot Wide Roadway Alternative, the roadway would be rehabilitated and re-designed in compliance with Caltrans and AASHTO standards for a 35 mph (minimum 20 mph) roadway. These roadway improvements would provide two eleven-foot wide travel lanes with three-foot shoulders and accommodate vehicle speeds between 20 and 35 mph. Grading would be increased significantly requiring cutting into the steep rocky upslope west of Shafter Bridge. Approximately 17 trees would need to be removed in order to provide sufficient roadway width in accordance with Caltrans and AASHTO design standards. While this alternative would bring the roadway geometry into compliance with Caltrans and AASHTO guidelines thereby improving roadway geometry for vehicular, bicycle and pedestrian traffic, it would result in substantial additional environmental impacts to natural resources and protected species in the vicinity of the roadway (i.e., tree removal, wetland fill, streambank alteration, and changes in topopgraphy). Therefore, the County considered this alternative to be unacceptable and set it aside from further consideration.
- **32-Foot Wide Roadway Alternative.** Under the 32-Foot Wide Roadway Alternative, the roadway would be rehabilitated and re-designed in compliance with Caltrans standards for a 45 mph roadway. This widened roadway would provide two twelve-foot wide travel lanes with four-foot wide shoulders and accommodate vehicle speeds up to 45 mph. The extent of grading would be significantly increased and approximately 67 trees would need to be removed to provide sufficient roadway width in accordance with Caltrans design standards. In addition, portions of Lagunitas Creek would need to be realigned and existing drainage structures would need to be redesigned and reconstructed. While this alternative would bring the roadway geometry into compliance with Caltrans guidelines and provide a wider roadway to facilitate vehicular and bicycle travel through this area, it would result in substantial additional environmental impacts to natural resources in the vicinity of the roadway (i.e., slope reconstruction, tree removal, wetland fill, and stream channel realignment). Therefore, the County considered this alternative to be unacceptable and set it aside from further consideration.

5.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires the identification of the environmentally superior alternative in an EIR. The impacts of the Proposed Project and the Mitigated Roadway Alternative are similar. The Mitigated Roadway Alternative would avoid the short-term visual impacts of the proposed retaining walls by removing most of the retaining walls from the project.. Because Option A is removed in the Mitigated Roadway Alternative, 9 fewer trees would be removed under this alternative, thereby reducing the tree impacts of the project and the need to replant mitigation trees in the watershed. The Mitigated Roadway Alternative would achieve all of the basic project objectives of the proposed project but would result in less paved road width in areas constrained by topography. Even though the proposed project does

not result in any significant environmental impacts that cannot be mitigated, the Mitigated Roadway Alternative avoids the short-term visual impact of retaining wall construction, and reduces the number of trees to be removed and associated mitigation by eliminating Option A. As a result, the Mitigated Roadway Alternative is considered the environmentally superior alternative.

CHAPTER 6.0
CEQA REQUIRED ASSESSMENT CONCLUSIONS

As required by CEQA, this chapter discusses the following types of impacts that could result from implementation of the proposed project: growth-inducing impacts; significant irreversible changes; cumulative impacts; effects found not to be significant; and unavoidable significant effects.

6.1 GROWTH INDUCING IMPACTS

A project is considered growth-inducing if it would directly or indirectly foster substantial economic or population growth or the construction of additional housing.[219] Examples of projects likely to have significant growth-inducing impacts include extensions or expansion of infrastructure systems beyond what is needed to serve project-specific demand, and development of new residential subdivisions or industrial parks in areas that are currently only sparsely developed or are undeveloped.

The proposed project is the rehabilitation of an existing roadway. Proposed improvements would extend the life of the roadway up to 30 years and would improve roadway travel conditions by providing a more uniform travel surface and reducing vehicle turning movements by limiting the number of pull-outs along the roadway. The improvements would not accommodate additional traffic or extend or expand infrastructure or services to existing undeveloped areas in the vicinity of the roadway. Surrounding land uses consist primarily of recreational uses on neighboring properties owned by the State of California (Samuel P. Taylor State Park) and the federal government (Golden Gate National Recreation Area). These areas are protected in perpetuity and not subject to future development. The proposed project would not result in any growth-inducing impacts.

6.2 UNAVOIDABLE SIGNIFICANT ENVIRONMENTAL IMPACTS

As described in Chapter 4.0, the proposed project would not result in any significant unavoidable impacts. Significant impacts have been identified in the following topical areas: aesthetics; biological resources; cultural resources; geology and soils; hydrology and water quality; hazards and hazardous materials; air quality; noise; and global climate change. However, these impacts can all be reduced to less-than-significant levels with implementation of the mitigation measures identified in this ~~Draft~~ EIR.

6.3 SIGNIFICANT IRREVERSIBLE CHANGES

CEQA requires that EIRs assess whether the project would result in significant irreversible changes to the physical environment. The *CEQA Guidelines* discuss three categories of significant irreversible changes that should be considered. Each category is discussed below.

[219] *CEQA Guidelines*, 2009. Section 15126.2(d)

6.3.1 Changes in Land Use which Commit Future Generations

Implementation of the proposed project would entail rehabilitation of an existing roadway within the Marin County right-of-way. No changes in existing land use would result from the project that would commit future generations.

6.3.2 Irreversible Damage from Environmental Accidents

No significant environmental damage, such as accidental spills or explosions of hazardous materials, is anticipated due to implementation of the proposed project. Construction activities associated with rehabilitation of the existing roadway would require the use of certain hazardous materials that are regulated and would be used in compliance with safe operation protocols. Such uses would not be of a scale that would risk an environmental accident of irreversible proportions. Compliance with federal, State, and local regulations, and the mitigation measures identified in Section 4.7 would reduce to a less-than-significant level the possibility that hazardous substances within the project area would cause significant environmental damage.

6.3.3 Consumption of Nonrenewable Resources

Consumption of nonrenewable resources includes conversion of agricultural lands, loss of access to mining reserves, and use of non-renewable energy sources. Implementation of the proposed project would not result in the loss of agricultural uses. Implementation of the proposed project would entail rehabilitation of an existing roadway within the Marin County right-of-way; therefore, valuable agricultural soils would not be lost through development of the project.

The project site does not contain significant mineral reserves. Therefore, implementation of the proposed project would not result in the loss of significant mineral resources.

Construction of the proposed project would require the use of energy to fuel grading vehicles, trucks, and other construction vehicles. All or most of this energy would be derived from non-renewable resources. Vehicles using the roadway would continue consume energy. However, approximately the same number of vehicles would utilize this road segment as in the current condition. Because the number of vehicles using the roadway would not be affected by the project and because there would be only a temporary net increase in fuel consumption during construction, the proposed project would not substantially deplete non-renewable fuel supplies.

6.4 CUMULATIVE IMPACTS

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 are individually limited, but cumulatively considerable. These impacts can 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 can result from individually minor but collectively significant projects taking place over a period of time."[220]

6.4.1 Methodology

When evaluating cumulative impacts, CEQA requires the use of either a list of past, present, and probable future projects, including projects outside the control of the lead agency, or a summary of projections in an adopted planning document, or some reasonable combination of the two approaches.

The cumulative analysis of this EIR is consistent with Section 15130(b)(1) of the CEQA Guidelines as it is based on both a list of past, present and probable future development projects in the area (short-term cumulative development) and a summary of development projections. Cumulative impacts would most likely result from short-term and long-term development in the immediate vicinity of the Sir Francis Drake Boulevard Rehabilitation Project. Where appropriate, this EIR assesses the short-term and long-term cumulative impacts that would result from the project plus other projected development throughout Marin County. The following sections review the anticipated short-term and long-term development in the project vicinity.

Short-Term Development. PROPDEV 45[221] lists 28 projects in various stages of development within unincorporated Marin County. Of these projects, 14 projects are under review, seven have been approved, five are under construction, one has recently completed construction, and one has been withdrawn, denied or expired. A summary of proposed development in unincorporated Marin County is shown in Table 6.4.A.

Table 6.4.A: Summary of Proposed Development in Unincorporated Marin County

Type	Under Review	Approved	Under Construction	Construction Complete	Withdrawn/Denied/ Expired
Residential	119 units	95 units	63 units	50 units	18 units
Office	7,6142 sq ft	468,750 sq ft	--	--	--
Retail	--	17,361 sq ft	--	--	--
Industrial	133,540 sq ft	25,100 sq ft	--	--	--
Other	32,600 sq ft	--	--	--	--

Source: PROPDEV 45 (June 2009)

Most of these projects are located adjacent to incorporated cities and towns and are quite distant from the project area. The three projects closest to the project area are described below.

1. The Harriman Lodge/Conference Center is a proposed lodge and conference center located in Olema. The 1.7-acre site would be developed with 18 hotel/motel rooms and 30 off-street parking

[220] *CEQA Guidelines*, 2009. Section 15355

[221] PROPDEV 45 is forty-fifth in a series of surveys of proposed development projects in Marin County (including cities). The survey provides information on all projects that include at least five residential units or 5,000 square feet of commercial, industrial, or institutional space. PROPDEV 45 includes information such as location, project sponsor, acreage, zoning, square feet of improvements, and status of application. The information in PROPDEV is obtained from County planning staff and planning departments in Marin cities and towns through a survey conducted twice a year. Marin County Community Development Agency, June 2009.

spaces. The project proposal is currently under review. This project is located approximately 7 miles from the project area.

2. The Bar-Or Subdivision is a proposed 5-lot subdivision and lot line adjustment in Point Reyes. The DZA, coastal permit and final map have been approved; however, no development is currently proposed. This project is located approximately 8 miles from the project area.
3. The Grandi Building is located at 11101 Highway One in Point Reyes Station. The applicant proposes to redevelop the existing historical building as a mixed-use project. The project would entail development of 22 hotel/motel rooms and the installation of 88 parking spaces. The Use Permit, Coastal Permit, and Design Review have been approved. This project is located approximately 9 miles from the project area.

Despite their relative distance from the project area, these three projects have been considered in the evaluation of cumulative impacts resulting from the proposed SFDB Rehabilitation Project.

Long-Term Development. Long-term countywide cumulative development can be estimated based on the 2007 Marin CWP. According to the Marin CWP, the majority of the land in the immediate vicinity of the project area is designated as Open Space (OS) and Agriculture (AG-1). These designations are intended to preserve land for open space and agricultural uses, including recreation, watershed, habitat protection, and agricultural production. As such, development would be limited to nonresidential structures necessary for agricultural operations and housing with a density of one dwelling unit per 31 to 60 acres. The potential development as outlined in the Marin CWP was considered in the cumulative analysis in this EIR along with the specific projects identified above.

6.4.2 Cumulative Effects of the Proposed Project

The following analysis examines the cumulative effects of the proposed project. The potential cumulative effects of the proposed project are summarized below for each of the topics that are analyzed in Chapter 4.0 of the EIR.

Land Use and Planning Policy. Planned development throughout Marin County would generally occur in the existing urban areas within the County. Development in unincorporated areas, like the project area, would largely be confined to agricultural and open space uses. Specific foreseeable projects, like the proposed project, would be consistent with the Marin CWP and County zoning requirements. The projects would be compatible with surrounding land uses and would not create barriers that would divide established neighborhoods. The proposed project entails rehabilitation of an existing roadway; it does not propose any changes to land use. Therefore, the proposed project's incremental contribution to land use impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Aesthetics. The area relevant to cumulative visual impacts is the project viewshed – namely, the area visible from the project site and areas that would have a view to the project site. The proposed project would alter the visual character of the project site through the removal of native trees and installation of retaining walls along sections of the roadway. Other cumulative projects could result in similar landscape changes in unincorporated Marin County, including the development of currently vacant land. However, due to the topography and their distance from the project area, these projects would

have no effect on the viewshed encompassed by the proposed project. As described in Section 4.2, the proposed project's impacts to aesthetics are considered less than significant. Therefore, the proposed project's incremental contribution to aesthetic impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Biological Resources. The geographic area for cumulative biological resource impacts encompasses the plant communities and habitats in the project vicinity, including Lagunitas Creek and its watershed. Implementation of the proposed project would result in the loss of existing wetlands (roadside ditches) and could adversely affect the habitat and populations of special-status plant and animal species, including three federally-listed salmonid species. Projects in Marin County planned for previously undeveloped sites could result in similar impacts to the habitat and population of protected plant and animal species. Project impacts to these resources would be reduced to less-than-significant levels with implementation of the mitigation measures in Section 4.3, Biological Resources. These measures fully mitigate for the loss of wetlands and impacts to special status plant and animals species, and also include measures to control construction-related runoff from entering Lagunitas Creek. In addition, drainage improvements proposed as part of the project would improve water quality over the existing condition by reducing sediments and pollutant concentrations in runoff in the long term. These improvements would have a beneficial effect on aquatic species in Lagunitas Creek. Therefore, the proposed project's incremental contribution to impacts on biological resources would not be cumulatively considerable and the cumulative impact would be less than significant.

Cultural Resources. The study area for cumulative cultural resource impacts encompasses the project site and adjacent areas that may contain resources relevant to the history and pre-history of California and Marin County. Construction activities associated with the proposed project could result in significant impacts to archaeological and paleontological resources and human remains. The proposed project's impacts to these resources would be reduced to less-than-significant levels with implementation of the mitigation measures in Section 4.4, Cultural Resources. These measures would fully protect identified and previously unidentified archeological resources, paleontological resources and human remains. No specific projects that would contribute to cumulative cultural resource impacts would occur in the project study area; other cumulative projects in the County would be subject to similar measures. Therefore, the proposed project's incremental contribution to impacts on cultural resources would not be cumulatively considerable and the cumulative impact would be less than significant.

Geology and Soils. The geographic area for cumulative geologic and soils impacts includes the project site and adjoining areas. The proposed project is located in an area that is subject to earthshaking, expansive soils, soil deformation, and landslides. The cumulative impacts associated with these geologic phenomena would be confined to the project vicinity and would be reduced to a less-than-significant levels with implementation of the mitigation measures recommended in Section 4.5, Geology and Soils. The geologic impacts of other cumulative projects in Marin County would be subject to similar measures. The project would have a beneficial effect on slope stability as it includes repair of retaining walls and the stabilization of some slopes along the roadway. Therefore, the proposed project's incremental contribution to geologic and soils impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Hydrology and Water Quality. The geographic area for cumulative hydrological and water quality impacts includes the project site, Lagunitas Creek and its watershed and Tomales Bay. Construction

activities and operation of the proposed roadway could generate stormwater runoff that could cause or contribute to a violation of water quality standards or waste discharge requirements or otherwise degrade the water quality of Lagunitas Creek. The implementation of mitigation measures outlined in Section 4.6, Hydrology and Water Quality would reduce the project's hydrology and water quality impacts to less-than-significant levels. Other planned projects in the County would be subject to similar measures in accordance with the County's MCSTOPPP and SWPPP requirements. The drainage improvements that are proposed as part of the project would reduce the volume of sediment and pollutants entering Lagunitas Creek (and ultimately Tomales Bay) and have a beneficial effect on water quality. Therefore, the proposed project's incremental contribution to hydrological and water quality impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Hazards and Hazardous Materials. The area of cumulative impact for hazards and hazardous materials encompasses the project site, including construction and staging areas. Implementation of the proposed project could result in the localized release of hazardous materials used during construction activities. The project could expose persons to wildfire hazards and hazardous materials at the project site. Cumulative projects in Marin County could also release hazardous materials associated with construction activities or result in wildfire hazards. However, the hazards impacts of the proposed project and planned projects are subject to federal, State and local hazardous materials regulations and fire safety regulations, and standard mitigation measures and conditions of approval. These requirements would reduce cumulative impacts to less-than-significant levels. Therefore, the proposed project's incremental contribution to hazards or hazardous materials impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Transportation and Circulation. The study area for cumulative transportation and circulation impacts is Sir Francis Drake Boulevard and nearby connecting roadways. The proposed project entails rehabilitation of an existing roadway; it would not generate additional permanent traffic on the roadway. Construction activities would create an additional three vehicle trips in each direction per day during the majority of project work and 28 trips in each direction per day during the last 14 days of construction. The marginal increase in traffic during project construction is considered less than significant. Other foreseeable projects in unincorporated Marin County, such as the hotel development in Olema, could generate increased vehicle traffic along Sir Francis Drake Boulevard through the project area, contributing to cumulative traffic impacts. However, because the proposed project would not generate additional vehicle traffic, the proposed project will not contribute to cumulative traffic impacts. Construction activities associated with the proposed project could result in traffic delays, safety concerns and pavement damage created by construction traffic. Such impacts would be localized to the project area and would be reduced to less-than-significant levels with implementation of Mitigation Measure TR-1. Therefore, the proposed project's incremental contribution to transportation and circulation impacts would not be cumulatively considerable and the cumulative impact is less than significant.

Air Quality. The geographic area for air quality impacts encompasses the air basin for some pollutants such as ozone, and is more localized for others, such as carbon monoxide hotspots. As long-term traffic levels on the roadway would not increase as a result of the project, the project would not contribute to long-term air quality impacts. As described in Section 4.9, Air Quality, construction activities in the project area could result in increased dust fall and locally elevated levels of PM_{10} downwind of construction activity. Implementation of Mitigation Measure AIR-1 would reduce this

impact to a less-than-significant level. Other projects in Marin County would be required to implement similar measures, consistent with guidance from the BAAQMD, to control construction period emissions. The proposed project's contribution to cumulative air quality impacts would not be considerable due to the implementation of Mitigation Measure AIR-1, which would reduce emissions of particulate matter resulting from project construction. Therefore, the proposed project's incremental contribution to air quality impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Noise. The area of impact for cumulative noise effects is localized to the project vicinity, as noise levels decline rapidly with distance. Long-term traffic levels on the roadway would not increase, and the rehabilitation of the roadway surface using ROC will reduce the level of noise currently generated by vehicle traffic on the existing deteriorated roadway surface. The rehabilitated roadway combined with no increase in traffic trips along the roadway means that the proposed project would not contribute to long-term noise levels in the project area. As described in Section 4.10, Noise, construction activities would result in a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. No other projects are currently proposed or under construction within the vicinity (1/4 mile) of the project site. Therefore, construction noise generated by the project would not be cumulatively considerable and the cumulative impact would be less than significant.

Public Services and Utilities. The geographic area for cumulative public services impacts is Marin County. Cumulative projects in Marin County could increase demand for police and fire services. This increased demand could compromise the emergency response times of the police and fire departments. However, these projects would be required to contribute their pro-rata share or other funding to the construction of new police and fire facilities in the County. These new facilities would allow emergency responders to maintain adequate emergency response times. The project would rehabilitate an existing roadway and as described in Section 4.11, implementation of the proposed project would not require the expansion of fire protection, police services, schools, or parks.

Implementation of the proposed project would not require the extension of water supply or wastewater conveyance infrastructure into the project site nor would it increase demand for water, wastewater treatment, or solid waste disposal. Potential impacts associated with the provision of portable restrooms during the construction period would be mitigated to a less than significant level with implementation of Mitigation Measure PS-1. Although on-site infrastructure improvements could be required to provide a range of utilities to cumulative projects in Marin County, associated impacts would generally be site-specific. Therefore, the proposed project's incremental contribution to public services and utilities impacts would not be cumulatively considerable and the cumulative impact would be less than significant.

Global Climate Change. Climate change is a global environmental problem in which: (a) any given development project contributes only a small portion of any net increase in GHGs and (b) global growth is continuing to contribute large amounts of GHGs across the world. The analysis of global climate change impacts and GHG emissions, by its nature, is primarily a cumulative impact analysis. As discussed in Section 4.12, Global Climate Change, the proposed project would emit GHG emissions only temporarily in association with project construction and would be consistent with applicable plans and policies for reducing GHG emissions with implementation of Mitigation

Measure GCC-1. Therefore, the proposed project's incremental contribution to global climate change would not be cumulatively considerable.

6.5 EFFECTS FOUND NOT TO BE SIGNIFICANT

This section summarizes issues for which the project would result in no impact in relation to a threshold of significance. Impacts that were determined to be less than significant include those for which the project would have an impact, but the level or degree of impact would be less than significant. These impacts are discussed in detail in Sections 4.1 through 4.12 of this EIR.

Land Use and Policy Consistency. Based on nature of the project in relation to the surrounding land uses, the project would not result in the physical division of a community nor would the project affect adjacent land uses, including open space and agricultural uses. The project area is not subject to any existing habitat conservation plans or natural community conservation plans. No impact would occur in regard to these issues. As determined in the Policy Consistency analysis in Section 4.1 of this EIR, the project would be consistent with applicable policies from the Marin CWP.

Aesthetics. The project area is not located along a state scenic highway; therefore, no impact would occur in regard to this issue. Project implementation would result in tree removal and changes to the existing roadway (i.e., pavement rehabilitation, removal of existing culverts, installation of retaining walls) that would alter the visual appearance of the roadway. Although project improvements and impacts would result in local visual effects, they would not substantial modify the existing visual characteristics of the roadway setting or change the overall scenic vistas available from the roadway. Therefore, these aesthetics impacts are considered less than significant.

Biological Resources. Implementation of the project could cause indirect impacts to San Francisco foxtail damselfly and California freshwater shrimp, two special-status species that could occur Lagunitas Creek. Best Management Practices (BMPs) to be implemented during and after construction would prevent the release of sediment and pollutants into Lagunitas Creek. Therefore, impacts to these species are considered less than significant. Implementation of the project would disturb common vegetation communities (i.e., ruderal, annual grasslands, coastal oak woodland, coastal scrub, mixed evergreen forest, and redwood forest). As these communities are locally common and a small amount of habitat would be disturbed, this impact is considered less than significant.

Geology and Soils. No active or potential active faults have been mapped at or adjacent to the project area and no portion of the site is located within an Alquist-Priolo Earthquake Fault Zone. The project is not located in an area mapped by the State of California or County of Marin as a source location for known mineral resources. The project is not located within an area with karst topography, old mining properties, or subject to subsidence cause by groundwater drawdown. No impact would occur in regard to these issues. As a result of improvements proposed by the project (i.e., slope repair, closure of unofficial pullouts), geologically-related erosion impacts from the finished project would be less-than-significant as the proposed project would result in a reduction in site conditions prone to erosion compared to existing conditions.

Hydrology and Water Quality. The project would not deplete groundwater supplies or interfere substantially with groundwater recharge. The project would not significantly alter the drainage pattern

of SFDB nor would it alter the course of Lagunitas Creek. The potential for the project to cause substantial erosion or siltation as a result of altering drainage patterns of a site or altering the course of Lagunitas Creek would be less than significant, as the project would provide a beneficial impact because it is improving erosive conditions. The project would not involve the construction of homes or other structures inside a 100-year flood zone. The project would not create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems. The project is not susceptible to a tsunami based on its location in relation to the coast. The risk of a seiche occurring at Kent Lake is highly unlikely; therefore, impacts related to sieche are less than significant. The project is located within the inundation area of Peters Dam. However, with Division of Safety of Dams oversight, the hazard from flooding due to dam failure inundation would be less than significant.

Hazards and Hazardous Materials. There are no existing schools located within ¼-mile of the project site. The project site is not included on the Cortese list of hazards materials sites compiled pursuant to Government Code Section 65962.5 by the DTSC. The project site does not overlap any airport land use plan and is not in close proximity to either a public or private airport. The project would not conflict with an emergency response or evacuation plan. No impact would occur in regards to these issues. Although the project area is classified as having a Moderate to High fire hazard, construction contractors are required to comply with fire prevention measures for forest-covered land identified in PRC Sections 4428-4442. Compliance with the existing fire prevention regulations would reduce the risk of increasing wildland fires to a less-than-significant level.

Traffic and Circulation. Project construction would result in temporary increases in vehicle trips on SFDB. However, added trips would be nominal, would only occur during the construction period and would not affect Level of Service on SFDB. Therefore, this impact is considered less than significant. The project would not have any impact on air traffic patterns. The project would discourage parking in unsafe areas by closing unofficial pullouts, but would have no affect on existing parking areas. Implementation of the project would result in a less hazardous environment for pedestrians and bicyclists by creating a uniform roadway surface; increased paved width, where appropriate; fewer vehicle-turning movements by removal of unofficial turnouts; and improved sight distance. These impacts are considered less than significant.

Air Quality. The project is consistent with the Clear Air Plan. The project would not contain any major sources of odor and would not be located in an area with existing objectionable odors. The completed project would not generate additional vehicle trips or allow for additional vehicles on the roadway; therefore the proposed project would not significant increase long-term regional or cumulative emissions in the air basin and would not violate air quality standards. These air quality impacts are considered less than significant.

Noise. The proposed project would not contain perceptible sources of long-term ground borne vibration. The project site is not located within the 55 dBA CNEL noise contour for nearby airports nor is the proposed project considered a sensitive receptor. The proposed project is not expected to increase traffic on SFDB; therefore, the project would not increase permanent noise levels at sensitive receptors in the project vicinity. These noise impacts are considered less than significant.

Public Services and Utilities. The project would not require added personnel or an expansion of facilities to adequately provide fire and police services. No impact would occur in regards to these

services. The project would not require added personnel or an expansion of facilities to adequately provide fire and police services. No impact would occur in regards to these services. During construction, solid waste from the project would be either recycled or transported to a landfill with sufficient capacity, thus no impact would occur in regards to this issue.

Global Climate Change. The project, once completed, would not result in increased greenhouse gas emissions because the project would not increase vehicle trips or vehicle miles traveled on the roadway. The project would not conflict with any plan or policy intended to reduce long-term greenhouse gas emissions, including AB 32 and SB 375. These impacts are considered less than significant.

CHAPTER 7.0
REPORT PREPARATION

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CHAPTER 8.0
ACRONYMS AND GLOSSARY OF TERMS

8.1 ACRONYMS

A-PEFZA	Alquist-Priolo Earthquake Fault Zoning Act
AASHTO	American Association of State Highway Officials
ABAG	Association of Bay Area Governments
ADL	Aerially-Deposited Lead
ADT	Average Daily Traffic
ARB	California Air Resources Board
BAAQMD	Bay Area Air Quality Management District
Basin Plan	Water Quality Control Plan for the San Francisco Bay Basin
BAT	Best Available Technology
BCT	Best Conventional Technology
bgs	below ground surface
BMPs	Best Management Practices
CAAQS	California Ambient Air Quality Standards
Cal/EPA	California Environmental Protection Agency
CalIPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CAP	Clean Air Plan
CCR	California Code of Regulations
CDF	California Department of Forestry and Fire Protection
CDFG	California Department of Fish & Game
CEC	California Energy Commission
CESA	California Endangered Species Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	Methane
CHRIS	California Historical Resources Information System
CIWMB	California Integrated Waste Management Board
CMA	Congestion Management Agency
CMP	2007 Marin Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO	Carbon Monoxide
County	Marin County
CSE	Countywide Siting Element

CTPB	Cement Treated Permeable Base
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CWP	Marin Countywide Plan
dB	decibel
dBA	A-weighted sound level
DBH	Diameter Breast Height (approximately 4.5 feet above ground)
DOSH	California Division of Occupational Safety and Health
DOT	United States Department of Transportation
DPW	Department of Public Works
DSD	Division of Safety of Dams
DTSC	Department of Toxic Substances Control
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EOP	Operational Area Emergency Operations Plan
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FAR	Floor Area Ratio
FEMA	Federal Emergency Management Agency
FIGR	Federated Indian Graton Rancheria
FIRM	Flood Insurance Rate Map
FMC	Fishery Management Councils
FHWA	Federal Highways Administration
GGNRA	Golden Gate National Recreation Area
GHGs	Greenhouse Gases
GIS	Geographic Information System
GPS	Global Positioning System
GWP	Global Warming Potential
HAZWOPER	Hazardous Waste Operations and Emergency Response
HCP/NCCP	Habitat Conservation Plan/Natural Community Conservation Plan
HFCs	Hydrofluorocarbons
HSPRMP	Health and Safety Plan and a Risk Management Plan
ISA	International Society of Arboriculture
JPA	Joint Powers Authority
L_{dn}	Day-night average sound level
L_{eq}	Equivalent continuous sound level
LOS	Level of Service
LSA	LSA Associates, Inc.
LSD	Lagunitas School District
LTS	Less than Significant
MBTA	Migratory Bird Treaty Acts
MCFD	Marin County Fire Department
MCOE	Marin County Office of Education
MCSO	Marin County Sheriff's Office
MCSTPPP	Marin County Stormwater Pollution Prevention Program
MCTD	Marin County Transit District

MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MLD	Most Likely Descendant
MMI	Modified Mercalli Intensity Scale
MMWD	Marin Municipal Water District
MPH	Miles Per Hour
MRCD	Marin Resource Conservation District
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NALs	Numeric Action Levels
NELs	Numeric Effluent Limitations
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NMFS	National Marine Fisheries Service
NMWD	North Marin Water District
NHPA	National Historic Preservation Act
N_2O	Nitrous Oxide
NO_2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Association Fisheries
NOP	Notice of Preparation
NPDES	National Pollution Discharge Elimination System
NRCS	United States Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
NWP	Northwestern Pacific
O_3	Ozone
OEHHA	Office of Environmental Health Hazard Assessment
OES	Office of Emergency Services
OHP	Office of Historic Preservation
OHWM	Ordinary High Water Mark
OSHA	Occupational Health and Safety Administration
PCBs	polychlorinated biphenyls
PFC	Permeable Friction Course
PFCs	Perfluorocarbons
$PM_{2.5}$	Fine Particulate Matter
PM_{10}	Coarse Particulate Matter
ppm	parts per million
PRBO	Point Reyes Bird Observatory
PRC	Public Resource Code
RAC	Rubberized Asphalt Concrete
RCRA	Resource Conservation and Recovery Act
RMP	Risk Management Plan
ROG	Reactive Organic Gases
RWQCB	Regional Water Quality Control Board
S	Significant
SAFZ	San Andreas Fault Zone
SARA	Superfund Amendments and Reauthorization Act

SCA	Stream Conservation Area
SF_6	Sulfur Hexafluoride
SFDB	Sir Francis Drake Boulevard
SFHA	Special Flood Hazard Area
SGVSEP	San Geronimo Valley Salmon Enhancement Plan
SHMA	Seismic Hazards Mapping Act
SMARA	Surface Mining and Reclamation Act
SO_2	Sulfur Dioxide
SR	State Route
SU	Significant and Unavoidable
SUSD	Shoreline Unified School District
SWAMP	State Board Surface Water Ambient Monitoring Program
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAM	Transportation Authority of Marin
TIA	Total Impervious Area
TMDL	Total Maximum Daily Load
TMP	Traffic Management Plan
TSCA	Toxic Substances Control Act
TUHSD	Tamalpais Union High School District
UCMP	University of California Museum of Paleontology
UCS	Uniform Construction Standards
UNFCCC	United Nations Framework Convention on Climate Change
USACE	United States Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
VMT	Vehicle Miles Traveled
VOCs	Volatile Organic Compounds
vph	vehicles per hour
WCA	Wetland Conservation Area

8.2 GLOSSARY

303(d) List: List of impaired water bodies published by each state and approved by the EPA pursuant to the Clean Water Act.

Alquist-Priolo Fault Zone: State-identified areas of potentially active and recently active faults.

Alquist-Priolo Earthquake Fault Zone Act: Places specific responsibilities on local governments for identification and evaluation of seismic and geologic hazards, and formulation of programs and regulations to reduce risk in identified locations.

Anadromous: Fish that migrate up rivers from the sea to breed and spawn in fresh water.

Artifact Scatter: This type of site contains a variety of artifacts such as cores, bifaces, ground stone, pottery, and debitage. Artifact scatters may represent short-term use areas or special purpose sites.

Ecofacts, such as bone, shell, charcoal, and fire-affected rock (FAR) are not present; with their addition, the site becomes a habitation site.

California Environmental Quality Act (CEQA): California law requiring the disclosure of environmental effects of proposed projects before discretionary approval can be issued.

Channel: The bed of a stream or waterway.

Cumulative impact: Two or more environmental effects that, when considered together, are considerable or that compound or increase other environmental impacts.

Dripline: The area located directly under the outer circumference of the tree branches.

Environmental Impact Report (EIR): A detailed CEQA document that is prepared when a proposal or alternatives have the potential for significant impact on the environment.

Evolutionarily Significant Unit (ESU): A population or group of populations that is substantially reproductively isolated from other populations of the same species and that represents an important component of the evolutionary legacy of the species. An ESU for Pacific salmon species is considered to be a distinct population segment (DPS), which may be listed under the ESA if believed to be in danger or extinction.

Historic Site: Sites that are not prehistoric or protohistoric, but are the remains of human activities more than 45 years old. An historic archaeological site is an historical site with a buried component such as a trash deposit, foundation or footing, or some other buried site component.

Invasive Exotic Species: Species that reproduce aggressively, that are non-native (i.e., do not naturally occur) in an ecosystem under consideration, and that cause or are likely to cause economic or environmental harm or harm to human health.

Lead agency: The agency either preparing or taking primary responsibility for preparing the CEQA document.

Lithic Scatter: A lithic or flake scatter contains a scatter of only flaked stone tools such as cores, lithic debitage, or bifaces that may have been created from one or more distinct lithic reduction episodes. If no subsurface distribution is evident, and the density of items is less than three flaked stone items per square meter, a lithic scatter can be referred to as a "sparse lithic scatter" (Jackson et al. 1988).

Mitigation: A modification of the proposal or alternative that lessens the intensity of its impact on a particular resource.

National Geodetic Vertical Datum (NGVD): A fixed surface reference established by the U.S. Coast and Geodetic Survey to which relief features and elevation data are referenced.

National Pollutant Discharge Elimination System (NPDES): A federal requirement under the Clean Water Act (CWA) that any discharge of a non-point source of pollution into waters of the United States be in conformance with any established water quality management plan developed under the Clean Water Act.

Notice of Preparation: Notice to regulatory agencies and the public of an intent to prepare an environmental impact report.

Ordinary High Water Mark: that line along the stream bank established by the fluctuations of stream flow and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, erosion, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other indicators. The ordinary high water line denotes the limits of waters of the U.S. under Section 404 of the Clean Water Act except where jurisdictional wetlands extend beyond the line. It also denotes the limits of the stream bed.

Permeable Friction Course: An open-graded asphalt mix, produced with relatively uniform-sized aggregate typified by an absence of intermediate-sized particles for the purpose of providing a permeable surface.

Project Site: The area that will be physically disturbed or has the potential to be physically disturbed by the proposed project which includes the SFDB paved roadbed and an approximate 20-foot wide zone from the edge of pavement.

Project Study Area: The project site and a zone of approximately 200 feet on either side of the project site within which habitat types were mapped and the potential for indirect biological impacts from the project were assessed.

Project Vicinity: The project site and surrounding region within approximately one mile of the project site, containing occurrences of special-status biota or suitable habitats for such species.

Right-of-Way: The right to pass over property owned by another. The strip of land over which facilities such as roadways, railroads, or power lines are built.

Riparian: Relating to, or living or located on the banks of a river or stream.

Rubberized Asphalt Concrete: Pavement material that consists of regular asphalt concrete mixed with reclaimed tire rubber.

Salmonid: Fish species belonging to, or characteristic of the family *Salmonidae*, which includes the salmon, trout, and whitefish.

Scoping: The early involvement of the interested and affected public.

Special Status Species: For purposes of this EIR, any species listed or proposed for listing under the State or federal Endangered Species Acts, or recognized as locally rare by recognized authorities.

Stormwater Management Plan: A project-specific plan to manage stormwater runoff, require for certain activities under the National Pollutant Discharge Elimination System.

Stormwater Pollution Prevention Plan: A project-specific plan to reduce water pollution from stormwater required for certain activities under the National Pollutant Discharge Elimination System.

Top of Bank: The upper limits of the stream channel zone that encompasses the lateral margins of the stream; the top of bank corresponds with the general limits of high stream flows that form the general morphological characteristics of the stream.

Tributary: A smaller river or stream that flows into a larger river or stream.

Watershed: The area from which water drains to a single point or body of water; also called drainage basin.

Wetland*:* An area that inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include, but are not limited to, swamps, marshes, bogs, and similar areas. (as defined by the U.S. Army Corps of Engineers and the U.S. EPA).