Crystal Springs Dam Bridge Replacement Project

Initial Study with Proposed Mitigated Negative Declaration

August 2009

Prepared by

ENTRIX
Down to Earth. Down to Business.™

Prepared for

COUNTY OF SAN MATEO
FOUNDED 1856

COUNTY BRIDGE NO. 67 / STATE BRIDGE NO. 35C-0043
SKYLINE BOULEVARD OVER THE CRYSTAL SPRINGS DAM

Crystal Springs Dam Bridge Replacement Project

INITIAL STUDY

WITH

PROPOSED MITIGATED NEGATIVE DECLARATION

AUGUST 2009

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Proposed
Mitigated Negative Declaration

Pursuant to Division 13, Public Resources Code Section 21080(c) and Article 6 of the CEQA Guidelines

Project Description

The County of San Mateo proposes to demolish and remove the existing Crystal Springs Dam Bridge that sits atop the Lower Crystal Springs Dam and replace it with a new, seismically and structurally sound bridge. The new bridge would provide two vehicle travel lanes and a multipurpose paved trail for bicyclists and pedestrians. The Crystal Springs Dam Bridge Replacement Project, or proposed Project, would be located in an unincorporated area of San Mateo County east of the Crystal Springs Reservoir.

The Project objectives are to:

- Provide a seismically sound bridge;
- Provide a structurally sound bridge;
- Accommodate future dam modifications; and
- Provide a safe trail connection.

Determination

This Proposed Mitigated Negative Declaration is intended to give notice to interested agencies and the public that the County of San Mateo intends to adopt a Mitigated Negative Declaration for this project. The County has prepared an Initial Study for this project and, pending public review, expects to determine from this Initial Study that the proposed Project would not have a significant effect on the environment for the following reasons:

1. The proposed Project would have no effect on agriculture and forest resources, mineral resources, and population and housing.

2. In addition, the proposed Project would have less than significant effects on aesthetics, land use and planning, noise, and recreation.

3. The proposed Project would have no significant adverse effect on air quality, biological resources, cultural resources, geology and soils, greenhouse gases, hazards and hazardous materials, hydrology and water quality, public services, transportation and traffic, and utilities and service systems after implementation of the following mitigation measures, which would reduce potential effects to less-than-significant levels:

    - **Mitigation Measure AIR-1:** The contractor will implement the following basic control measures from the Bay Area Air Quality Management District's (BAAQMD) Feasible Control Measures for Construction Emissions of PM_{10} (BAAQMD 1999):

- Water all active construction areas at least twice daily.

- Cover all trucks hauling soil, sand, and other loose materials *or* require all trucks to maintain at least two feet of freeboard.

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

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

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

- **Mitigation Measure AIR-2:** The contractor(s) will implement the following measures to reduce diesel exhaust, thereby reducing ozone precursor emissions.

  - All equipment used in earthwork shall be tuned and maintained to the manufacturer's specification to maximize efficient burning of vehicle fuel.

  - The operator shall maintain and effectively utilize and schedule on-site equipment in order to minimize exhaust emissions from truck idling.

- **Mitigation Measure BIO-1:** The Contractor will conduct worker environmental awareness training prior to the start of demolition and construction activities. The training will include information on identification and avoidance measures for special-status species and sensitive habitats potentially present in the Project impact area.

- **Mitigation Measure BIO-2:** Grasslands supporting host plants for the bay checkerspot butterfly will be fenced for avoidance or surveys will be conducted to determine that the butterfly is not present prior to implementation of construction activities.

- **Mitigation Measure BIO-3:** Take avoidance measures for San Francisco garter snake will be implemented in all areas where construction could result in the direct take of this species. Measures will include pre-construction survey and relocation plans, exclusion fencing, environmental education programs, and biological monitoring during all construction phases.

- **Mitigation Measure BIO-4:** The County has developed take avoidance measures for the California red-legged frog and San Francisco garter snake in consultation with U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) as part of a Section 7 Consultation. These measures are described in the 2009 USFWS Amendment to the Biological Opinion (see Appendix E). To avoid and minimize Project effects to California red-legged frog and San Francisco garter snake during demolition and construction, the County will follow all avoidance and minimization measures outlined in the 2009 Biological Opinion, summarized below:

  - Retain a qualified biologist(s) to act as an on-site biological monitor for the duration of the project construction and to oversee all other take avoidance measures for these species.

  - Relocate approximately half of the California red-legged frog egg masses from the pool on top of the dam in the breeding season prior to the initiation of construction, unless otherwise approved by the Service. Erect a fence to prevent California red-legged frog (and San Francisco garter

snake) from moving from the dam pool into the dam area north of the pool during demolition and construction.

- Protect the dam pool and all life stages of California red-legged frog from disturbance from construction while leaving a natural egress and ingress area at the southern end of the dam pool for California red-legged frog to move safely in and out of the pool from the south end until the demolition is occurring directly over the pool. Once demolition reaches the area above the pool, a platform will be installed over the pond to prevent any demolition debris from entering.

- After construction is complete, restore the dam pool to its pre-construction condition if necessary (replace lost plants and remove sediments to maintain pre-construction levels). Photographs will be taken of the dam pool and measurements will be made of the various elements of the dam pool to document the pre-construction conditions.

In order to implement the proposed minimization measures, the demolition of the existing bridge and construction of the new bridge have been divided into several stages. These minimization measures will occur at certain times of the year in order to coincide with the particular stages of California red-legged frog development. The construction stages and schedule have been designed to:

- Avoid and minimize disturbance to the area at the south end of the bridge where the pool on top of the dam is located;

- Minimize delays in the start and duration of construction; and

- Minimize the disturbance to California red-legged frog migrations to and from the dam pool.

- **Mitigation Measure BIO-5:** Prior to the implementation demolition of the bridge, the County will initiate an enhancement plan of a minimum of approximately 0.25 acre of occupied California red-legged frog breeding pond and San Francisco garter snake foraging habitat within the immediate Crystal Springs Watershed, as outlined in the 2009 USFWS Amendment to the Biological Opinion (See Appendix E). This enhancement activity will consist of predator control (bullfrog and non-native turtle) at one of the closest known California red-legged frog breeding locations, Tracy Lake and the contiguous adjacent marsh at the northern end of Lower Crystal Springs Reservoir. These mitigation activities would not result in disturbance (e.g., grading or vegetation removal) of natural environments at Tracy Lake. This is an important area for reproduction to the north of the dam pool. These areas are distinct or isolated enough that depredation can be beneficial to the co-occurring California red-legged frog and San Francisco garter snake populations.

  Depredation will take the form of bullfrog egg mass removal, seining and selective removal of bullfrog larvae, and direct removal of adult and juvenile bullfrog and turtles through aquatic trapping and gigging. The program will begin concurrently with the bridge replacement project start up. This program will benefit both California red-legged frog and San Francisco garter snake and includes an area significantly larger than 0.25 acre. Removal of bullfrog and other non-native predators in this area is expected to provide benefit to both California red-legged frog and San Francisco garter snake populations that are known to occur in Tracy Lake and the upper marsh of Lower Crystal Springs Reservoir. The depredation program will continue for two years. Bullfrogs breed in the upper marsh of Lower Crystal Springs Reservoir, and juvenile and adult bullfrogs occupy Tracy Lake. Other introduced predators present at the area include red-eared sliders, painted turtles and soft shelled turtles. Swaim Biological (Swaim Biological) found a painted turtle in the process of eating a tree frog in Tracy Lake on February 15, 2007 (K. Swaim, pers. comm. 2009). The following schedule to control predators would be used to control predators:

- Removal of bullfrog egg masses (late March through June), and

- Removal of larval, adult, and metamorphosed bullfrog and non-native turtles (late March through October).

Bullfrogs will be euthanized and stomach contents documented. The biological consultant may keep two or three of each non-native turtle species for use in public education efforts about not releasing non-native species. Other captured non-native turtles will be taken to local turtle rescue centers, including the Bay Area Turtle and Tortoise Rescue Center in Castro Valley. Any that are not accepted by rescue centers will be euthanized.

- **Mitigation Measure BIO-6:** A pre-construction survey will be conducted to determine if peregrine falcons are nesting on the Interstate 280 (I-280) bridge. If no nesting falcons are observed, no further mitigation will be necessary.

- **Mitigation Measure BIO-7:** If peregrine falcons are found to be nesting on the I-280 bridge, nest monitoring will be conducted during construction. If no disturbance to incubation or the feeding of chicks is observed, no additional mitigation for nesting activities will be necessary.

- **Mitigation Measure BIO-8:** If it is determined during monitoring that Project construction activities are interrupting peregrine falcon egg incubation or the feeding of the chicks, further mitigation measures will be developed in coordination with CDFG.

- **Mitigation Measure BIO-9:** If a fledgling peregrine falcon enters the construction area, all construction activity will cease until the bird leaves the area. A qualified biologist may haze or move the bird from the area.

- **Mitigation Measure BIO-10:** If a fledgling peregrine falcon enters the construction area and is injured, construction activities will cease until the bird is removed from the area by a qualified biologist. Any injured peregrine falcon will be transported to an approved facility such as that operated by the Santa Cruz Predatory Bird Research Group for care.

- **Mitigation Measure BIO-11:** A biological monitor will inspect the construction site each morning prior to the beginning of construction activities. Any western pond turtles that are in the Project impact area will be removed and transported to a suitable release site downstream. The number and size of any captured turtles, as well as the release site, will be reported to CDFG.

- **Mitigation Measure BIO-12:** The County will develop a Restoration, Monitoring, and Reporting Plan (RMRP) prior to Project implementation. The RMRP will provide details of restoration and enhancement activities, monitoring, and reporting. RMRP elements will include identification of the areas in which restoration will occur, specifics on removal of any existing vegetation that must be accomplished, details of site preparation, species and sizes of material to be planted, irrigation options as needed, performance criteria, frequency and duration of monitoring, reporting requirements, and interventions to be implemented if performance criteria are not met.

- **Mitigation Measure CR-1:** If, at any time, archaeological resources are identified within the Project area, the Contractor(s) excavations within 50 feet of the find shall be temporarily halted or diverted until the discovery is examined by a qualified archaeologist. The archaeologist shall notify the Contractor to determine the procedures to be followed before construction is allowed to resume at the location of the find. If disturbance of the archaeological site cannot be avoided, data recovery within the affected area shall be conducted by a certified archaeologist in accordance with CEQA Guidelines Section 15064.5 so as to record and preserve the significant characteristics of the site.

- **Mitigation Measure GEO-1:** The County will implement the BMPs and conservation measures detailed in the County of San Mateo Watershed Protection Program's Maintenance Standards (San Mateo County 2004) to prevent erosion and siltation. The County will also prepare and implement a Stormwater Pollution Prevention Plan (SWPPP), as required by the NPDES General Construction permit. Both the San Mateo County and SWPPP BMPs will outline any and all measures needed to control stormwater or construction water runoff to prevent erosion, protect habitat, and eliminate or reduce water and soil pollution. These BMPs will be written and approved by San Mateo County and San Mateo Countywide Stormwater Pollution Prevention Program prior to implementation of construction activities. Implementation of the BMPs will be monitored and ensured by a County approved environmental monitor.

- **Mitigation Measure PS-1:** Prior to initiating construction, San Mateo County shall require the construction contractor to contact the Underground Service Alert (USA) to identify and avoid (or protect) existing lines, cables, and other electrical facilities during construction activities to ensure the integrity of existing utility systems.

- **Mitigation Measure TRANS-1:** The County will implement traffic detour routes for the duration of Project construction (see Appendix G: Construction Detour Routes).

  Signs and alternative routes will be advertised and posted for the public. The County will notify emergency service providers of these alternative routes prior to the start of construction to minimize impacts on emergency response times. The detour routes would be as follows:

  - **South of the Bridge.** Northbound traffic on Skyline Boulevard will be directed onto Highway 92 for vehicular traffic or Bunker Hill Drive for both vehicular and bicycle traffic. From there, traffic will be directed to northbound Polhemus Road (County Road 17). From Polhemus Road, traffic will be directed west on Crystal Springs Road, where it will meet with Skyline Boulevard north of the construction site. Expected detour length is 5 miles for vehicular traffic using Highway 92 or 3.6 miles for vehicular or bicycle traffic using Bunker Hill Drive.

  - **North of the Bridge.** Southbound traffic on Skyline Boulevard will be directed east on Crystal Springs Road. From there, traffic will be directed to southbound Polhemus Road (County Road 17). From Polhemus Road vehicular traffic will be directed west on Highway 92 or Bunker Hill Drive for both vehicular and bicycle traffic, where it will meet with Skyline Boulevard south of the construction site. Expected detour length is 5 miles for vehicular traffic using Highway 92 or 3.6 miles for vehicular or bicycle traffic using Bunker Hill Drive.

  - Bicycle traffic will have another detour option in lieu of using Bunker Hill Drive, which may be too steep for some bicyclists:

    - **Detour for bicycle traffic coming from north of the Crystal Springs Dam Bridge either via the terminus of the Sawyer Camp Trail or Skyline Boulevard.** Southbound bicycle traffic on Skyline Boulevard or Sawyer Camp Trail will be directed east (left turn or straight respectively) onto Crystal Springs Road. From there, bicycle traffic will be directed southbound (right turn) onto Polhemus Road which then becomes Ralston Avenue near the Highway 92 interchange. Immediately south of the Ralston Avenue/Highway 92 interchange, bicycle traffic will be directed west (right turn) onto the Ralston Recreational Trail (a 1-mile-long paved recreational trail) which runs parallel to Highway 92 and connects to Cañada Road via a bicycle/pedestrian bridge that crosses over I-280 south of the construction site. The total bicycle traffic detour length is 4 miles. If crossing over the Crystal Springs Dam Bridge from the Sawyer Camp Trail terminus (at intersection of Crystal Springs Road and

Skyline Boulevard immediately north of the bridge) to Cañada Road, the distance is 2.5 miles.

- **Detour for bicycle traffic coming from south of the bridge from Highway 92.** Bicycle traffic traveling in an easterly direction on Highway 92, (coming down from the top of the Highway 92/Skyline Boulevard intersection) will have the option to either make a left turn (northbound) onto Skyline Boulevard at the lighted signal intersection on Highway 92 and Skyline Boulevard (located immediately east of San Francisco Public Utilities Commission's [SFPUC] Crystal Springs Reservoir and west of I-280) and continue northbound towards the Bunker Hill Drive detour (right turn) which connects to Polhemus Road or have the option to continue easterly on Highway 92 and make a right turn (southbound) onto Cañada Road and connect to the Ralston Recreational Trail detour described above.

- **Mitigation Measure TRANS-2**: The County will coordinate construction schedules and traffic management plans with the SFPUC to minimize disruption to traffic flow on Crystal Springs Road and all nearby streets.

- **Mitigation Measure UTIL-1:** The Contractor will develop a waste management or recycling plan that include procedures to identify the types of debris that would be generated by the Project and describe how all waste streams will be handled, actions to reuse or recycle construction debris and clean excavated soil to the extent possible, and actions to divert at least 50 percent of inert solids (asphalt, brick, concrete, dirt, fines, rock, sand, soil, and stone) from disposal in a landfill.

James C. Porter, Director of Public Works
County of San Mateo

August 26, 2009
Date

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Abbreviations & Acronyms

APE	Area of Potential Effect
BAAQMD	Bay Area Air Quality Management District
BMPs	best management practices
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Data Base
CNEL	Community Noise Equivalent Level
ESA	Environmentally Sensitive Area
HBRRP	Highway Bridge Replacement and Rehabilitation Program
HCAS	Historic Context and Archaeological Survey Report
HPSR	Historic Property Survey Report
I-280	Interstate 280
MCE	Maximum Credible Earthquake
mph	miles per hour
NRHP	National Register of Historic Places
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter

PMF	Probable Maximum Flood
PRC	Public Resources Code
RMRP	Restoration, Monitoring, and Reporting Plan
SFBAAB	San Francisco Bay Area Air Basin
SFPUC	San Francisco Public Utilities Commission
SHPO	State Historic Preservation Officer
SWPPP	Stormwater Pollution Prevention Plan
USA	Underground Service Alert
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WSIP	Water System Improvement Program

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SECTION 1

Introduction

The County of San Mateo proposes to demolish and remove the existing Crystal Springs Dam Bridge that sits atop the Lower Crystal Springs Dam and replace it with a new, seismically and structurally sound bridge. The new bridge would provide two vehicle travel lanes and a multipurpose paved trail for bicyclists and pedestrians. The Crystal Springs Dam Bridge Replacement Project, or proposed Project, would be located in an unincorporated area of San Mateo County east of the Crystal Springs Reservoir. The County of San Mateo is serving as the Lead Agency for this project under the California Environmental Quality Act (CEQA).

This Initial Study describes the Project as proposed, discusses potential environmental impacts that may result from Project implementation and their level of significance, and identifies mitigation measures to reduce these impacts to a less-than-significant level. This Initial Study identifies potentially significant impacts on the following resources:

- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gases
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Public Services
- Transportation and Traffic
- Utilities and Service Systems

Mitigation measures have been identified to reduce all potentially significant Project impacts to a less-than-significant level.

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SECTION 2

Project Description

2.1 PROJECT BACKGROUND

The Crystal Springs Dam Bridge (County Bridge Number 67) was constructed in 1924 as part of State Route 35 and is situated on an easement over the top of the Lower Crystal Springs Dam, owned by the San Francisco Public Utilities Commission (SFPUC). When Interstate 280 (I-280) was completed in 1971, the California Department of Transportation (Caltrans) relinquished the highway right-of-way for use as a San Mateo County highway, and the bridge easement was conveyed to the County. The County highway across the bridge is Skyline Boulevard.

In 1986, the bridge was analyzed and found to be structurally incapable of withstanding the Maximum Credible Earthquake (MCE) for the area (Nolte and Associates, Inc. 1994). A condition assessment done in 2002 revealed that the bridge was classified as seismically unsafe and was estimated to have six to ten years of remaining life (Parsons Brinckerhoff Quade & Douglas, Inc. 2002). Both 2007 and 2008 Caltrans bridge inspection reports noted that, due to its overall condition, the bridge should be replaced. (Caltrans 2008a).

In addition to seismic considerations, the existing bridge is potentially unsafe due to deterioration of the columns that have occurred (Nolte and Associates, Inc. 1994). Many of the existing columns are cracked and spalled (fragmented) with rusted rebar exposed. Continued use of the bridge and vibration from vehicles passing over the bridge are expected to worsen these conditions, and could potentially lead to failure of portions of the bridge over time. In 2002, the bridge lanes were re-striped to move loads away from girders in poor condition on the west side of the bridge. The bridge was re-signed, reducing the speed limit from 30 miles per hour (mph) to 25 mph and imposing weight restrictions.

The vicinity of the Crystal Springs Reservoir is a popular place for recreational uses, including bicycling, jogging, and hiking. The Sawyer Camp Trail, a paved multipurpose trail beginning approximately 600 feet north of the bridge, is heavily used by recreationists, both on weekends and during the week. To the south, the northernmost segment of the Crystal Springs Regional Trail North along the Crystal Springs Reservoir on SFPUC watershed lands is currently under design. The existing bridge has narrow shoulders, and there is potential for safety risks to recreationists crossing the bridge from the existing trail on the north side to the proposed trail on the south side, especially as recreational use in the area by pedestrians and bicyclists increases.

The SFPUC is currently designing a project that would contain the Probable Maximum Flood (PMF) for the Crystal Springs Reservoir. The SFPUC's preferred design would increase the height of the parapet wall on the reservoir side of the dam by 9.5 feet. This increased height, however, would not fit underneath the existing bridge. The proposed Project and SFPUC Lower Crystal Springs Dam Improvements Project have separate funding and separate objectives, and would be implemented irrespective of plans for the other project. However, the close proximity of the two projects in time and location allows some coordination of engineering design. As a result of the design coordination, the profile of the new bridge would be raised to accommodate the new height of the dam's parapet wall. In addition, the Crystal Springs Dam Bridge replacement schedule is closely linked to the SFPUC's dam improvement project schedule, as both projects would contribute to the duration of the traffic impacts on Skyline Boulevard. Therefore, the bridge construction schedule would stagger construction of the two projects such that dam improvements can be constructed after demolition of the existing bridge and before construction of the new bridge.

The SFPUC project is part of a series of improvements to the SFPUC's Hetch Hetchy water system known collectively as the Water System Improvement Program (WSIP). Section 3.18 considers potential cumulative impacts associated with the WSIP projects and, in particular, those in the vicinity of the proposed Project.

2.2 PROJECT OBJECTIVES

The objectives of the proposed Project are to:

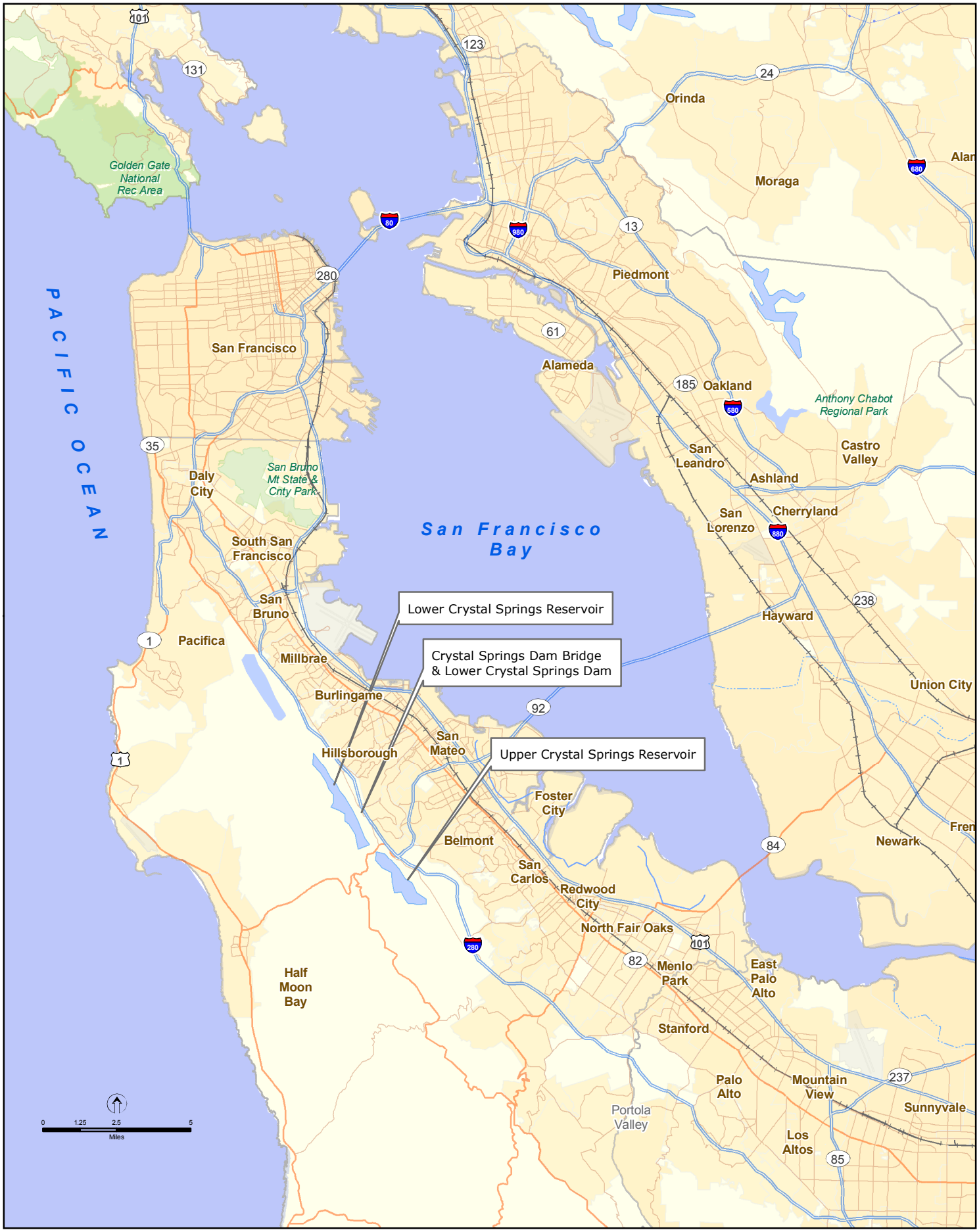
- **Provide a Seismically Sound Bridge.** The bridge is structurally incapable of withstanding the MCE for the area (Nolte and Associates, Inc. 1994). Therefore, one Project objective is to provide a bridge that meets current seismic codes and that can withstand the MCE to ensure the safety of bridge users during seismic events.
- **Provide a Structurally Sound Bridge.** Deterioration of columns has led to the potential for failure of portions of the bridge. The Project proposes to provide a bridge with structurally sound components to ensure that bridge users are not exposed to unsafe and potentially dangerous conditions.
- **Accommodate Future Dam Modifications.** SFPUC's preferred design for the dam improvements would increase the height of the parapet wall on the reservoir side of the dam by 9.5 feet. The County proposes to accommodate this design by raising the profile of the bridge.
- **Provide a Safe Trail Connection.** Many recreationists currently walk or bicycle across the bridge in the vehicle lanes. The proposed separated 15-foot multipurpose path on the new bridge would be separated from the vehicle lanes and would provide for a safe partial connection between the trails for recreationists.

2.3 PROJECT DESCRIPTION

The proposed Project consists of the replacement of the existing bridge, located southwest of the intersection of Crystal Springs Road and I-280 in San Mateo County, California. This bridge, also known as the Skyline Boulevard Bridge (County Bridge Number 67, State Number 35C-0043), is situated on top of the Lower Crystal Springs Dam and provides vehicular access to points north and south of the dam. Figure 1 identifies the Project location within the larger San Francisco Bay Area. Figure 2 shows the Project vicinity, and Figure 3 shows the Project construction site. The following subsections provide a description of the design and construction characteristics of the new bridge.

2.3.1 Bridge Dimensions

The proposed Project would result in the replacement of the existing bridge with a new concrete and steel-reinforced bridge. The new 51.5-foot-wide, 612.5-foot-long bridge would replace the existing 33-foot-wide, 608-foot-long bridge. This bridge would accommodate two 12-foot-wide vehicle travel lanes, with 4-foot-wide paved shoulders on both sides and a 15-foot-wide multipurpose paved trail on the western side of the bridge. This trail would be separated from the vehicle lanes by a 4.5-foot-high concrete barrier and railing. The exterior bridge barriers would also consist of these combined concrete barrier and railing structures. Plan and cross-section drawings of the existing and proposed bridge are included in Appendix F of this Initial Study. The new bridge would be approximately 18.5 feet wider than the existing bridge and would overhang the dam more than the existing bridge.

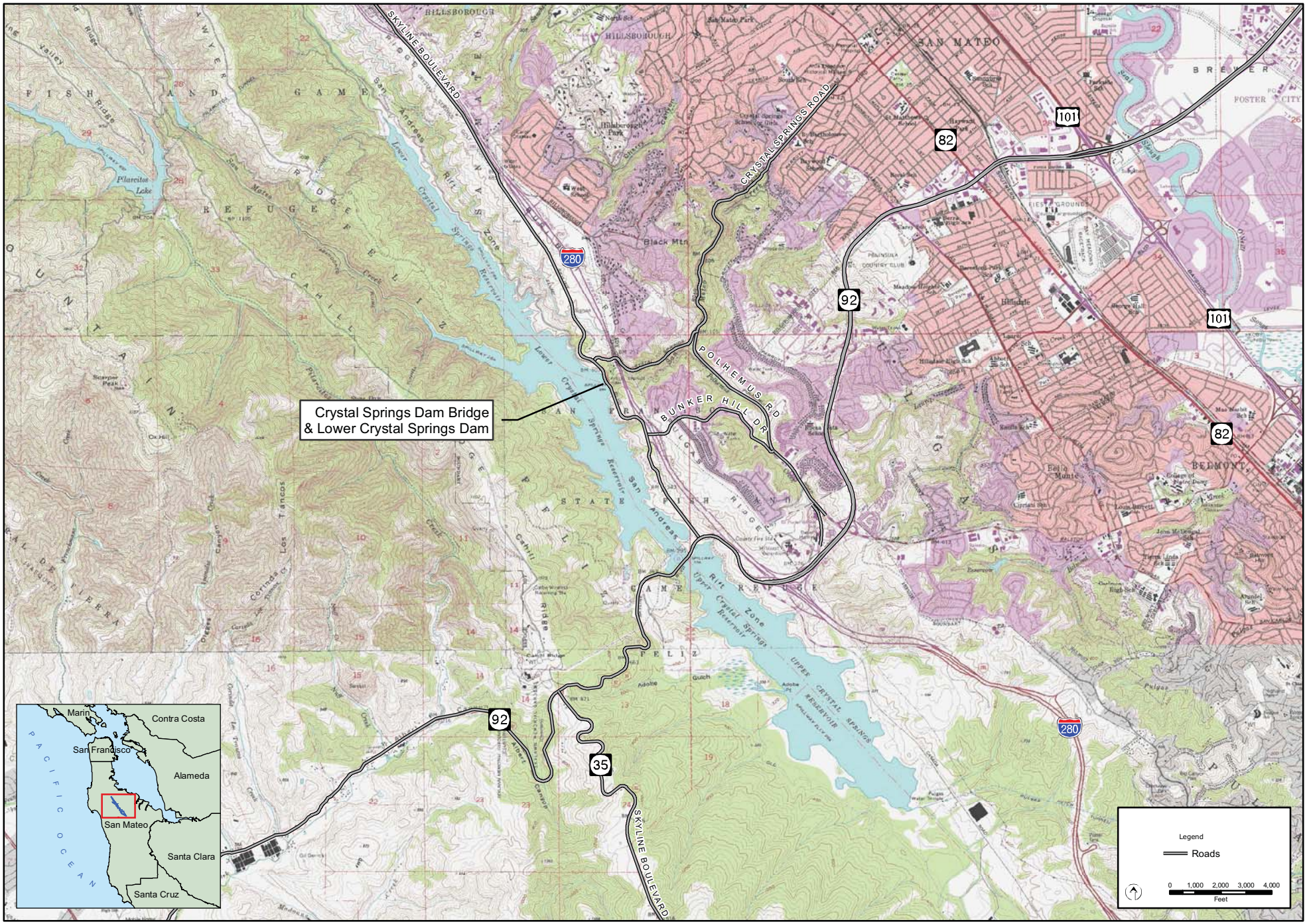


Source: ENTRIX, Inc., 2008

Crystal Springs Dam Bridge Replacement Project

Figure 1

Project Location Map



Source: ENTRIX, Inc., 2008

Crystal Springs Dam Bridge Replacement Project

Figure 2

Project Vicinity Map

Source: ENTRIX, Inc., 2008

Crystal Springs Dam Bridge Replacement Project

Figure 3

Project Construction Site

The new bridge would be comprised of seven spans with a minimum span length of 70 feet and a maximum span length of 107 feet. Due to the length of the proposed spans, the proposed new bridge would be classified as a "Long-Span Bridge." The bridge superstructure would be a cast-in-place, post-tensioned concrete box-girder. The box-girder would have an average depth of 4 feet through the entire length. Similar to the existing bridge, the new bridge would be supported on the Lower Crystal Springs Dam, while the bridge abutments would be supported on the slopes above the dam and would be founded on rock formation with spread footings.

The existing bridge has 19 support structure locations, each with five columns (see Appendix F).The support system for the new bridge would consist of a series of six bent column locations along the length of the bridge, each having two columns, for a total of 12 columns (see Appendix F). Each column would be 3 feet deep and 6 feet wide. This system would replace the existing support system for the bridge, which consists of a total of 95 columns. The new abutments and bent columns would be cast-in-place reinforced concrete.

2.3.2 Bridge Design

The new bridge would be designed to withstand the MCE in the area. Each column and abutment would have dynamic isolation bearings (also called seismic isolation pads) at the bottom to reduce the lateral (seismic) forces at the base of the columns (see Appendix F). Bridges supported on these pads are less susceptible to earthquake damage because they are able to resist earthquake force elastically. This design would also reduce the seismically induced forces in the bridge structure and the subsequent reactions exerted on the underlying dam. The seismic isolation pad would reduce the earthquake-induced force in the bridge by a factor of up to 5 times (Parsons Brinckerhoff Quade & Douglas, Inc. 1996).

The improved seismic design of the new bridge would allow the number of columns and footings to be reduced from 95 columns for the existing bridge to 12 columns for the new bridge. While each of the new columns would be wider than the existing columns, the overall surface area of the column footings on the supporting dam would be reduced.

2.3.3 Bridge Profile and Grade

The new bridge would be approximately 7 feet higher than the existing bridge to accommodate the height of SFPUC's new parapet wall with a clearance under the bridge of approximately 1 to 2 feet. The roadway to the north and south of the new bridge (i.e., Skyline Boulevard) would be slightly re-contoured to meet the profile of the new bridge. This would be accomplished by raising the grade of Skyline Boulevard at both the north and south ends of the bridge by approximately 7 feet. Since the road climbs in elevation at each end of the bridge as the road extends away from the bridge, the raised grade would taper off at further distances from the bridge. The raised grade of the road would extend for approximately 500 feet from the bridge on both the north and south ends. Access to the parking area on the north side would be adjusted to function with the new grade as well. Typical cross-section drawings of these approaches are included in Appendix F of this Initial Study.

The new bridge would be designed to slope to the east and away from the reservoir so that roadway runoff would flow down the east side of the dam and not into the reservoir on the west. Because the multipurpose path would be bound on both sides by concrete, drains would be installed along the length of the path. These drains would carry surface runoff from the path under the bridge roadway surface, with outfalls on the east side of the bridge. The design would minimize the potential for flow of roadway runoff into Crystal Springs Reservoir.

The new bridge would be centered on the existing dam and would maintain essentially the same alignment as the existing bridge. The existing roadway is currently signed for 25 mph traffic. The American Association of

State Highway and Transportation Officials recommend design speeds of 30 to 40 mph for local roads in rolling to mountainous terrain. The proposed new bridge and roadway approach is designed to meet the design standards for 30 mph vehicle speed. Design speeds greater than 30 mph could not be achieved using the existing alignment.

2.4 PROJECT SETTING

The bridge structure is located directly above the Lower Crystal Springs Dam. The roadway re-contouring, bridge replacement, and parking access adjustment work would occur entirely within the Skyline Boulevard roadway right-of-way. The site is bordered by SFPUC property to the east and west with the Crystal Springs Reservoir adjacent to the west side of the Project area.

The Project is approximately 1,650 linear feet in length and is located on Franciscan Complex, a mixture of marine sedimentary rocks and volcanic rocks subject to repeated geologic deformation. The predominant bedrock type at the dam and bridge abutments is greywacke, a fine-grained, well-cemented sandstone containing some shale. Fill was placed behind both existing bridge abutments in 1923. The fill has been in place for 68 years and appears to be well compacted (Wahler & Associates 1992).

The biological habitat at the site is Mixed Evergreen Forest Vegetation on the upper slopes adjacent to the existing bridge abutments. This vegetation type also includes other trees, such as Monterey pine and Monterey cypress, which are not native to the area. It is presumed that these and some of the other non-native plants on the site were introduced at the time the dam was originally constructed. Typical shrubs in this area are poison oak, toyon, and blackberry. Understory herbaceous plants occur in open spots in the Mixed Evergreen Forest, especially near the existing abutments. The most common herbaceous understory plants are Pacific sanicle, bittercress, vetch, Indian warrior, miner's lettuce, and bedstraw. Along the north abutment, there is a dense thicket of poison oak, toyon, and Australian tea tree.

Streamside vegetation along the edge of San Mateo Creek includes riparian trees such as big-leaf maple, and red and arroyo willows. The bed of the creek is vegetated with the following emergent plants: water parsley, horsetail, broadleaved cattail, water plantain, and common large monkey flower. Continual leakage from the dam face and the regular drainage of water from pipes on the north and south side of the creek support a year-round low flow in San Mateo Creek in an easterly direction.

Water currently collects on the top of the dam between the existing parapet walls at this location. Over the years, sediments have collected at this location, and aquatic vegetation and algae are present. The soils that exist on top of the dam are likely no more than several inches deep. This vegetated area is not considered wetlands under the jurisdiction of the U.S. Army Corps of Engineers (USACE), as bridge sits on top of a dam (R. Smith, pers. comm. 2008).

California red-legged frogs are present on top of the dam. The 1999 Biological Opinion indicated that the top of dam pool was one of only two breeding "populations" of California red-legged frog in the Crystal Springs area (USFWS 1999). In 1998, a Caltrans biologist, McGinnis, surveyed many sites around the reservoir, but found breeding only at the top of the dam pool and in the Tracy Lake/upper marsh area of Crystal Springs Reservoir. McGinnis reported two individual adult California red-legged frog specimens were found during protocol level surveys at Caltrans Sed Basins 4 and 5. In addition, a single adult was observed by McGinnis on the southwest shore of Lower Crystal Springs Reservoir near Highway 92. Since that time, several other breeding locations or likely breeding populations have been documented by Kossack in 2003 and Swaim Biological in 2005 and 2006 (USFWS 2009). The 1999 Biological Opinion and 2009 Amendment to the Biological Opinion are included as Appendices D and E of this Initial Study.

Other areas in the watershed support California red-legged frog breeding or are suspected to support breeding California red-legged frog populations or sub-populations. These include survey sites where several recently

metamorphosed California red-legged frog or adult California red-legged frog have been observed and the habitat is physically suitable for breeding (e.g. Crystal Springs Golf Course pond).

There are no other sensitive or special habitat areas on or in the immediate proximity of the Project site.

2.5 CONSTRUCTION CHARACTERISTICS

The construction of the proposed Project would begin with the demolition and removal of the existing bridge. Once the existing bridge has been removed, SFPUC would occupy the premises to construct their proposed dam improvements. When the spillway improvements are completed, the County would initiate construction of the new bridge. The proposed Project would use conventional construction methods. Bridge construction would be cast-in-place concrete, post-tensioned from end to end. Foundation support on top of the dam would require drilling and grouting of holes for steel bar anchorages. No blasting would be performed. The roadway to the north and south of the new bridge would be slightly re-contoured to meet the profile of the new bridge.

The demolition of the existing bridge is expected to take approximately 6 months. The SFPUC project is expected to take approximately 18 to 24 months, and construction of the new bridge is expected to take approximately 12 months. During this time, the bridge would be closed to vehicle traffic. Impacts on traffic and mitigation measures are discussed in Section 3.3.16, Transportation and Traffic.

The vista point parking area on the north side of the bridge would be closed during construction for use as a staging area. Most construction equipment would be stored at this site while in use so that equipment would not need to be delivered to the site on a daily basis. Duration of equipment use is estimated at 6 months during demolition and 12 months during construction. Employee vehicles and trucks delivering and/or hauling materials to and from the site would typically travel to and from the site on a daily basis. These vehicles would access the site from both the north and south on Skyline Boulevard.

Construction activities, grading and filling, and staging of construction equipment associated with the proposed Project would result in disturbance on and immediately adjacent to the bridge replacement site. The maximum area that could be disturbed during construction would be approximately 80 feet wide and 1,650 feet long, or approximately 2.04 acres. Potential disturbance would be of two types: construction on top of the dam and construction adjacent to the dam. These two types of disturbance are described below.

2.5.1 Construction on Top of Dam

Construction activities that would occur on top of the existing dam include:

- Demolition of existing bridge and removal of materials;
- Construction of new bridge; and
- Construction equipment and activities on top of the dam.

Approximately 31,000 square feet (0.71 acre) of the bridge area would be exposed to disturbance from construction activities. Construction techniques and best management practices (BMPs) would be defined in the construction plans and specifications to avoid the deposition of sediments or construction materials in San Mateo Creek and/or Lower Crystal Springs Reservoir.

2.5.2 Construction Adjacent to Dam

Construction activities that would occur adjacent to the existing dam include:

- Excavation and grading during installation of the bridge abutments;
- Grading and filling to bring the roadway approaches up to the grade of the new bridge; and
- Construction equipment and staging activities on both sides of the bridge.

Approximately 58,000 square feet (1.33 acres) of the roadway approach area would be exposed to disturbance from construction activities. These activities would result in ground disturbance, and some of the area affected by this disturbance would require vegetation removal. All construction equipment and vehicle staging would be confined to construction areas.

2.6 PROJECT FUNDING AND SCHEDULE

The Project will be funded with both Highway Bridge Replacement and Rehabilitation Program (HBRRP) funds and local agency matching funds.

Project construction is scheduled to begin in Spring 2010 with the demolition of the existing bridge, which is expected to take approximately 6 months. Project activities would cease while the SFPUC project is constructed; the SFPUC project is expected to take approximately 18 to 24 months. Construction of the new bridge would begin at the end of SFPUC improvements. Construction of the new bridge is expected to take approximately 12 months.

2.7 SUMMARY OF PROJECT PERMITS / APPROVALS

The Project would require permits and review from various agencies, such as those listed in Table 1.

Table 1 Potentially Required Permits and Approvals

Agency	Permit
Federal	
U.S. Fish and Wildlife Service	Endangered Species Act Section 7 and Biological Opinion
State	
State Water Resources Control Board	NPDES Stormwater Permit (Construction General Permit 99-08-DWQ)

SECTION 3

Impact Assessment

This section is structured as an expansion of the CEQA checklist (CEQA Guidelines Appendix G). This assessment identifies the potential changes in the environment that could occur as a result of the proposed Project in each of the resource areas listed in Section 3.1 and analyzes the significance level of each potential impact. Significance levels are described as follows:

- **Potentially Significant.** Impact that needs further review to determine significance level (i.e., an Environmental Impact Report).
- **Less than Significant with Mitigation.** Impact that is not considered significant after implementation of proposed mitigation measures.
- **Less than Significant.** Impact that is not considered significant and no mitigation is required to reduce the significance level.
- **No Impact.** The Project would not have an adverse effect.

For each resource area, significance criteria are listed and a significance level is given for each criterion. Substantiation is provided for each significance determination. For impacts that were found to be potentially significant, mitigation measures are proposed to reduce these impacts to a less-than-significant level. No impacts were identified that would remain potentially significant after implementation of the proposed mitigation measures.

3.1 AESTHETICS

Would the project:	Potentially Significant	Less than Significant with Mitigation	Less than Significant	No Impact
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

DISCUSSION

a) A vista point that is located to the north of the dam and bridge provides scenic views of Lower Crystal Springs Reservoir and of the dam and bridge. The vista point would be closed to the public during demolition and construction and would re-open after construction is complete; therefore, views of the active construction site would not be visible from this location. The new bridge would be visible from the vista point after construction is complete, but would not degrade the vividness, intactness, or unity of views from the vista point. Therefore, the Project would not have a substantial adverse effect on scenic views, and impacts would be less than significant.

b) The Project site is located within an area of scenic undeveloped open space along I-280, a state-designated scenic route also known as the Junipero Serra Freeway (Caltrans no date). I-280 runs parallel to the bridge about 550 feet to the east; however, the Project site is not visible from I-280 because the freeway overpass is situated far enough above the bridge that freeway drivers cannot view it. Furthermore, the Project would not substantially damage scenic resources within the Project area, such as trees and rock outcroppings. Therefore, the Project would have a less-than-significant effect on this State-designated scenic route.

c) The Project site is visible from some of the residences located along San Mateo Creek and from portions of Sawyer Camp Trail. Temporary construction activities would be visible from these locations, but the Project site would be returned to pre-construction conditions after construction is complete. While the new bridge would be approximately 7 feet higher and 18 feet wider than the existing bridge, the overall profile, mass, and scale would not appear substantially different. The Project would not substantially degrade the visual character or quality of the site and its surroundings. Impacts would be less than significant.

d) Construction activity would occur between 7 a.m. and 6 p.m., Monday to Friday. During the winter, lighting in the immediate construction area may be required during early morning or late afternoon construction work. Construction-related lighting would be localized, intermittent, and limited in duration; additionally, construction would occur in an area that is largely undeveloped, and the nearest residence is approximately 1,200 feet away. Construction is therefore not considered a substantial source of light, and construction lighting would not adversely affect nighttime views in the area or substantially affect other people or properties. Glare would be limited to potential reflections from construction equipment, but would be temporary, minor, and localized. Therefore, impacts from construction-related lighting and glare would be less than significant.

No new sources of light are proposed as part of Project operation. The new bridge would consist of non-reflective materials, similar to the existing bridge, and long-term impacts from increased glare would be less than significant.

3.2 AGRICULTURE AND FOREST RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined in Public Resources Code section 4526)?	☐	☐	☐	☒
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

DISCUSSION

a) The Project site is classified by the Farmland Mapping and Monitoring Program as "Other Land," a non-agricultural classification (California Department of Conservation 2007). No lands under Williamson Act contracts are present at or near the construction site (San Mateo County 2005), and it is not zoned for agricultural purposes (San Mateo County 1994). No impact would occur.

b) See Item a).

c) The construction area includes portions of land designated by San Mateo County as forest land (San Mateo County 1994). Although several trees would be removed from around the bridge approaches during construction, the Project involves replacing an existing bridge within an existing road corridor and would not require rezoning or conflict with the current zoning of this land. No impact would occur. Tree removal impacts are discussed in Section 3.3.4, Biological Resources.

d) Although the Project would require the removal of several trees within land designated as forest land, as discussed in Section 3.3.4, Biological Resources, these trees would be replaced nearby. The Project would not result in the loss of forest land or conversion of forest land to non-forest use. No impact would occur.

e) The Project would not cause other long-term changes in the environment, such as diverting water from agricultural use to other uses that could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use. No impact would occur.

3.3 AIR QUALITY

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☒	☐	☐
d. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e. Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

DISCUSSION

a) The 2005 Bay Area Ozone Strategy is the most recent applicable air quality plan, although a 2009 Clean Air Plan is currently in preparation as an update to the 2005 plan (BAAQMD 2005). At this time, the BAAQMD has not prepared an attainment plan for particulate matter. Project construction would result in the temporary, localized generation of ozone precursor emissions from vehicle and equipment exhaust and dust; however, the extent and duration of Project construction is limited, and the 2005 plan is based on an assumed level of regional construction activity that accounts for Project emissions. Therefore, these emissions would not conflict with or obstruct implementation of this plan, and impacts would be less than significant.

b) Construction activities would generate fugitive dust, a portion of which would be particulate matter less than 10 microns in diameter (PM_{10}) and less than 2.5 microns in diameter ($PM_{2.5}$). Of the pollutants that could be generated by construction activities, PM_{10} is of greatest concern to the BAAQMD. Fugitive dust emissions could cause substantial increases in localized concentrations of PM_{10} and could affect PM_{10} compliance with ambient air quality standards on a regional basis. The state has designated the San Francisco Bay Area Air Basin (SFBAAB) as being in nonattainment of state 24-hour and state annual average PM_{10} standards, and state and federal annual average $PM_{2.5}$ standards. Construction-related increases in PM_{10} and $PM_{2.5}$ concentrations would result in a significant impact because the Project could contribute substantially to this existing violation and/or result in a cumulatively considerable net increase in particulate matter emissions. Implementation of Mitigation Measures AIR-1 would reduce impacts from fugitive dust.

Mitigation Measure AIR-1: The contractor will implement the following basic control measures from the BAAQMD's Feasible Control Measures for Construction Emissions of PM_{10}:

Table 2 Basic Control Measures for Construction Emissions of PM_{10}

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose materials *or* require all trucks to maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.

Source: BAAQMD 1999

c) As described in Item b, construction activities would generate fugitive dust that could cause substantial increases in localized concentrations of PM_{10}.

Additionally, construction would result in emissions of ozone precursors such as nitrous oxides and reactive organic gases, which are components of diesel exhaust. The state has designated the SFBAAB as being in nonattainment of state 1-hour and federal 8-hour ozone standards. Construction-related increases in ozone concentrations due to ozone precursor emissions would result in a significant impact because the Project could contribute substantially to this existing violation and/or result in a cumulatively considerable net increase in particulate matter emissions.

The BAAQMD considers construction-related emissions from all projects in this region to be mitigated to a less-than-significant level if all feasible control measures listed in the BAAQMD CEQA Guidelines (BAAQMD 1999) are implemented. Because $PM_{2.5}$ is a component of PM_{10}, $PM_{2.5}$ emissions would also be reduced with implementation of these measures. Implementation of Mitigation Measures AIR-1 and AIR-2 would reduce impacts from construction emissions.

Mitigation Measure AIR-2: The contractor(s) will implement the following measures to reduce diesel exhaust, thereby reducing ozone precursor emissions.

- All equipment used in earthwork shall be tuned and maintained to the manufacturer's specification to maximize efficient burning of vehicle fuel.
- The operator shall maintain and effectively utilize and schedule on-site equipment in order to minimize exhaust emissions from truck idling.

d) There are no adjacent sensitive receptors that would be affected by fugitive dust or other emissions at the construction site, as the closest receptors are residences located approximately 1,200 feet from the Project site. Recreationists using the Sawyer Camp Trail that may park along Skyline Boulevard near the construction site could experience occasional dusty conditions, but would not be exposed to substantial pollutant concentrations. This impact would be less than significant. Additionally, implementation of Mitigation Measure AIR-1 would reduce fugitive dust emissions at the construction site.

e) During construction, diesel exhaust from vehicles and equipment could result in highly localized odors. The closest residences are located approximately 1,200 feet from the Project site and would not be affected. Recreationists that may park along Skyline Boulevard near the construction site could be exposed to exhaust odors for short periods of time. This impact would be less than significant. Additionally, implementation of Mitigation Measure AIR-2 would reduce diesel exhaust at the construction site.

3.4 BIOLOGICAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☒
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

DISCUSSION

a) The California red-legged frog, peregrine falcon, western pond turtle, San Francisco garter snake, and bay checkerspot butterfly do or may exist in the Project area.

SPECIAL STATUS PLANT SPECIES

Based on data in the California Natural Diversity Data Base (CNDDB) and other literature sources, there are 12 special-status plant species initially identified as potentially occurring in the vicinity of the Project (CDFG 2008a, USFWS 2008). Four plant species that are federally or state-listed are known to occur within three miles of the Project impact area: San Mateo thorn-mint (*Acanthomintha duttonii*), fountain thistle (*Cirsium fontinale* var. *fontinale*), Marin western flax (*Hesperolinon congestum*), and white-rayed *pentachaeta* (*Pentachaeta bellidiflora*). None of these plants were found in the Project impact area during surveys conducted in 2006.

Habitat for eight other special-status plant species is present in the Project impact area: Franciscan onion (*Allium peninsulare* var. *franciscanum*), bent-flowered fiddleneck (*Amsinckia lunaris*), San Francisco collinsia (*Collinsia multicolor*), western leatherwood (*Dirca occidentalis*), Hillsborough chocolate lily (*Fritillaria biflora* var. *ineziana*), fragrant fritillary (*Fritillaria liliacea*), Crystal Springs lessingia (*Lessingia arachnoidea*), and arcuate bush mallow (*Malacothamnus arcuatus* [=M. *fasciculatus*]).

CALIFORNIA RED-LEGGED FROG

California red-legged frog is federally listed as threatened (Federal Register 1996) and is a California species of special concern (CDFG 2008b). The USFWS released a recovery plan in 2002 (USFWS 2002). Critical habitat was redesignated on April 13, 2006 (Federal Register 2006). Upper Crystal Springs Reservoir is not designated as critical habitat for the California red-legged frog, but Lower Crystal Springs Reservoir is in Critical Habitat Unit SNM 1A.

California red-legged frog are usually confined to aquatic habitats such as creeks, streams and ponds, and occur primarily in areas having pools approximately three feet deep, with adjacent dense emergent or riparian vegetation (Jennings and Hayes 1988). Adult frogs move seasonally between their egg-laying sites and foraging habitat, but generally they rarely move large distances from their aquatic habitat. California red-legged frog breed from November to March. Egg masses are attached to emergent vegetation (Jennings and Hayes 1994) and hatch within 14 days. Metamorphosis generally occurs between July and September. The California red-legged frog is known to occur in a pool on top of the dam and in San Mateo Creek below the dam (USFWS 2009).

Construction impacts would include permanent impacts on 0.29 acre of potential low quality upland/dispersal habitat adjacent to the bridge approaches in the Project area and temporary impacts on 0.06 acre of pond habitat in the Project impact area on top of Crystal Springs Dam. California red-legged frog could disperse throughout the Project impact area. Direct impacts on California red-legged frog could occur from construction activities. Mitigation for these impacts has been developed in formal consultation with USFWS.

SAN FRANCISCO GARTER SNAKE

The San Francisco garter snake is listed as an endangered species at both the federal and state level and is a state fully protected species. No critical habitat has been designated or proposed for this snake. The San Francisco garter snake, a distinctive subspecies of the common garter snake, is restricted to the San Francisco Peninsula. San Francisco garter snake populations are known to exist in approximately 60 sites in San Mateo County and one site in Santa Cruz County (Barry 1994). San Francisco garter snake is most frequently encountered in the vicinity of dense riparian and emergent vegetation along the borders of ponds, lakes, and streams. It is a habitat specialist, historically occurring in the sag ponds and marshes found along the peninsula in San Mateo County and northern Santa Cruz County (Fox 1951). Riparian and aquatic sites are important because frogs, which comprise approximately 95 percent of San Francisco garter snake diet, are most common in such habitat (Barry 1994, 1996). Upland meadows are also present at all localities hosting San Francisco garter snake, and these meadows are usually contiguous with the riparian aquatic habitat component. Meadows offer basking habitat and hibernacula, which usually consist of rodent burrows and perhaps underground crevices and fissures (Barry 1994; Larsen 1994).

San Francisco garter snake was observed during visual surveys conducted by Swaim Biological in 2006, and one San Francisco garter snake was captured near the foot of Lower Crystal Springs Dam in 2007 studies (K. Swaim, pers. comm. 2009). The San Francisco garter snake is not expected to occur in pool on top of the dam, due to extremely limited access, lack of suitable retreats and lack of direct sunlight. Dispersal/secondary habitat for the San Francisco garter snake includes vegetated upland areas adjacent to Skyline Boulevard where the snake may disperse on rare occasions between the aquatic habitats below the dam in San Mateo Creek and the Lower Crystal Springs Reservoir on the west side of Skyline Boulevard.

PEREGRINE FALCON

The American peregrine falcon is state listed as endangered and is a California fully protected species (CDFG 2008b). This falcon was formerly federally listed as endangered (Federal Register 1970a, 1970b), but was delisted in 1999 (Federal Register 1999). The primary nesting habitat for the American peregrine falcon tends to be cliffs or series of cliffs that dominate the surrounding landscape. However, suitable nesting sites can also be found in river cutbanks, trees, and manmade structures including tall towers and the ledges of tall buildings. American peregrine falcons hunt their prey in the air, usually over open habitat types such as waterways, fields, and wetland areas, diving at speeds of up to 200 mph to strike their targets. Jays, flickers, meadowlarks, pigeons, starlings, shorebirds, waterfowl, and other readily available species make up the American peregrine falcon's diet. The raptor may travel 10 to 12 miles from their nests in search of prey. Breeding takes place in later March and April, with a usual clutch size

of three to four eggs. Adults continue to feed fledglings for up to two months after the fledglings leave the nest.

The Santa Cruz Predatory Bird Research Group observed an adult peregrine feeding a juvenile within the Project area downstream from the Crystal Springs Dam Bridge during a breeding bird survey in late June 2007 (G. Stewart, pers. comm. 2008). The two birds perched on the I-280 bridge that crosses San Mateo Creek downstream from Crystal Springs Dam Bridge. No evidence of nesting was observed, and the birds were not observed on the initial visit the previous week. ENTRIX biologists also observed peregrine falcons at the I-280 bridge across San Mateo Creek in 2007.

The reservoir and associated waterfowl represent suitable foraging resources for this species. Peregrine falcons potentially could nest on the supporting pylons of the I-280 bridge. If nesting occurred, noise, lights, and construction activities for the bridge replacement could result in disturbance to the nesting birds. Potentially, a newly fledged peregrine falcon could enter the construction area and be injured.

The two falcons observed in June 2007 did not appear to be disturbed by the noise from the pump station adjacent to Crystal Springs Dam or from traffic on I-280, or by the presence of pedestrians on the bridge. Peregrine falcons at the I-280 bridge are unlikely to be disturbed by the presence of construction workers at the Crystal Springs Dam Bridge, which is approximately 525 feet from the I-280 bridge. The Project would comply with the County noise ordinance (San Mateo County 1982). There would be no night work and no lighting for night work for most of the construction period, although night lighting would be required for one continuous two-day pour. However, the work lights will be turned away from the I-280 bridge and towards the work site.

WESTERN POND TURTLE

The Western pond turtle is state-listed as a species of special concern. Western pond turtles excavate nests in the grasslands adjacent to the reservoir and utilize upland areas for basking. If turtles enter the construction area, direct impacts to this species could occur.

BAY CHECKERSPOT BUTTERFLY

Potential habitat for the bay checkerspot butterfly is present adjacent to the Project area on the shoreline of Lower Crystal Springs Reservoir. The bay checkerspot butterfly is federally listed as threatened (Federal Register 1987). Critical habitat was designated for bay checkerspot butterfly on April 30, 2001, was and a revision was proposed on August 22, 2007 (Federal Register 2001, 2007). This revision proposes to add an area just southeast of the Project area, immediately east of I-280, but does not include any land in the Project impact area.

This butterfly utilizes more than one larval host plant species. Following mid-spring mating, the female butterflies lay their eggs on a native plantain (*Plantago erecta*). If the plantain is not sufficient for development, the larvae may move onto one of two species of owl's clover (*Castilleja densiflorus* or *C. exserta*), which remain palatable for a longer period. Generally, one season is not sufficient for completion of development and the larvae must enter dormancy (which is spent under rocks or in cracks in the soil) until the following winter when the rains allow plant growth to begin again. The larvae then emerge to feed for a little longer, eventually pupating in late winter. The adults emerge shortly thereafter (Essig Museum 2006).

Host plants for this species were observed along the eastern side of Lower Crystal Springs Reservoir adjacent to the Project impact area in 2006 surveys. These plants are in an area mapped as sandstone-derived Fagan loam and Los Gatos loam (USDA 1991) and may not provide habitat for the bay checkerspot, which is typically found on plants growing on serpentine or serpentine-derived soils. However, map units of these soils sometimes have inclusions of Obispo clay, which is serpentine-derived (USDA 1991).

The following mitigation measures would avoid impacts to special-status species:

Mitigation Measure BIO-1: The Contractor will conduct worker environmental awareness training prior to the start of demolition and construction activities. The training will include information on identification and avoidance measures for special-status species and sensitive habitats potentially present in the Project impact area.

Mitigation Measure BIO-2: Grasslands supporting host plants for the bay checkerspot butterfly will be fenced for avoidance or surveys will be conducted to determine that the butterfly is not present prior to implementation of construction activities.

Mitigation Measure BIO-3: Take avoidance measures for San Francisco garter snake will be implemented in all areas where construction could result in the direct take of this species. Measures will include pre-construction survey and relocation plans, exclusion fencing, environmental education programs, and biological monitoring during all construction phases.

Mitigation Measure BIO-4: The County has developed take avoidance measures for the California red-legged frog and San Francisco garter snake in consultation with U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) as part of a Section 7 Consultation. These measures are described in the 2009 USFWS Amendment to the Biological Opinion (see Appendix E). To avoid and minimize Project effects to California red-legged frog and San Francisco garter snake during demolition and construction, the County will follow all avoidance and minimization measures outlined in the 2009 Biological Opinion, summarized below:

- Retain a qualified biologist(s) to act as an on-site biological monitor for the duration of the project construction and to oversee all other take avoidance measures for these species.
- Relocate approximately half of the California red-legged frog egg masses from the pool on top of the dam in the breeding season prior to the initiation of construction, unless otherwise approved by the Service. Erect a fence to prevent California red-legged frog (and San Francisco garter snake) from moving from the dam pool into the dam area north of the pool during demolition and construction.
- Protect the dam pool and all life stages of California red-legged frog from disturbance from construction while leaving a natural egress and ingress area at the southern end of the dam pool for California red-legged frog to move safely in and out of the pool from the south end until the demolition is occurring directly over the pool. Once demolition reaches the area above the pool, a platform will be installed over the pond to prevent any demolition debris from entering.
- After construction is complete, restore the dam pool to its pre-construction condition if necessary (replace lost plants and remove sediments to maintain pre-construction levels). Photographs will be taken of the dam pool and measurements will be made of the various elements of the dam pool to document the pre-construction conditions.

In order to implement the proposed minimization measures, the demolition of the existing bridge and construction of the new bridge have been divided into several stages. These minimization measures will occur at certain times of the year in order to coincide with the particular stages of California red-legged frog development. The construction stages and schedule have been designed to:

- Avoid and minimize disturbance to the area at the south end of the bridge where the pool on top of the dam is located;
- Minimize delays in the start and duration of construction; and
- Minimize the disturbance to California red-legged frog migrations to and from the dam pool.

Mitigation Measure BIO-5: Prior to the implementation demolition of the bridge, the County will initiate an enhancement plan of a minimum of approximately 0.25 acre of occupied California red-legged frog breeding pond and San Francisco garter snake foraging habitat within the immediate Crystal Springs Watershed, as outlined in the 2009 USFWS Amendment to the Biological Opinion (see Appendix E). This enhancement activity will consist of predator control (bullfrog and non-native turtle) at one of the closest known California red-legged frog breeding locations, Tracy Lake and the contiguous adjacent marsh at the northern end of Lower Crystal Springs Reservoir. These mitigation activities would not result in disturbance (e.g., grading or vegetation removal) of natural environments at Tracy Lake. This is an important area for reproduction to the north of the dam pool. These areas are distinct or isolated enough that depredation can be beneficial to the co-occurring California red-legged frog and San Francisco garter snake populations.

Depredation will take the form of bullfrog egg mass removal, seining and selective removal of bullfrog larvae, and direct removal of adult and juvenile bullfrog and turtles through aquatic trapping and gigging. The program will begin concurrently with the bridge replacement project start up. This program will benefit both California red-legged frog and San Francisco garter snake and includes an area significantly larger than 0.25 acre. Removal of bullfrog and other non-native predators in this area is expected to provide benefit to both California red-legged frog and San Francisco garter snake populations that are known to occur in Tracy Lake and the upper marsh of Lower Crystal Springs Reservoir. The depredation program will continue for two years. Bullfrogs breed in the upper marsh of Lower Crystal Springs Reservoir, and juvenile and adult bullfrogs occupy Tracy Lake. Other introduced predators present at the area include red-eared sliders, painted turtles and soft shelled turtles. Swaim Biological (Swaim Biological) found a painted turtle in the process of eating a tree frog in Tracy Lake on February 15, 2007 (K. Swaim, pers. comm. 2009). The following schedule to control predators would be used to control predators:

- Removal of bullfrog egg masses (late March through June), and
- Removal of larval, adult, and metamorphosed bullfrog and non-native turtles (late March through October).

Bullfrogs will be euthanized and stomach contents documented. The biological consultant may keep two or three of each non-native turtle species for use in public education efforts about not releasing non-native species. Other captured non-native turtles will be taken to local turtle rescue centers, including the Bay Area Turtle and Tortoise Rescue Center in Castro Valley. Any that are not accepted by rescue centers will be euthanized.

Mitigation Measure BIO-6: A pre-construction survey will be conducted to determine if peregrine falcons are nesting on the I-280 bridge. If no nesting falcons are observed, no further mitigation will be necessary.

Mitigation Measure BIO-7: If peregrine falcons are found to be nesting on the I-280 bridge, nest monitoring will be conducted during construction. If no disturbance to incubation or the feeding of chicks is observed, no additional mitigation for nesting activities will be necessary.

Mitigation Measure BIO-8: If it is determined during monitoring that Project construction activities are interrupting peregrine falcon egg incubation or the feeding of the chicks, further mitigation measures will be developed in coordination with CDFG.

Mitigation Measure BIO-9: If a fledgling peregrine falcon enters the construction area, all construction activity will cease until the bird leaves the area. A qualified biologist may haze or move the bird from the area.

Mitigation Measure BIO-10: If a fledgling peregrine falcon enters the construction area and is injured, construction activities will cease until the bird is removed from the area by a qualified biologist. Any injured peregrine falcon will be transported to an approved facility such as that operated by the Santa Cruz Predatory Bird Research Group for care.

Mitigation Measure BIO-11: A biological monitor will inspect the construction site each morning prior to the beginning of construction activities. Any western pond turtles that are in the Project impact area will be removed and transported to a suitable release site downstream. The number and size of any captured turtles, as well as the release site, will be reported to CDFG.

b) No riparian habitat or federally protected wetlands are present in the Project area. No impact would occur.

c) See Item b)

d) The Project site does not include established native resident or migratory wildlife corridors or native wildlife nursery sites. The Project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, nor would it impede the use of native wildlife nursery sites. Impacts would be less than significant.

e) A tree survey was conducted in the Project impact area on June 25, 2008. The results are provided in the table below. Tree species observed included coast live oak, canyon live oak (*Quercus chrysolepis*), unspecified live oaks (*Quercus* spp.), California bay (*Umbellularia californica*), toyon, Oregon ash (*Fraxinus latifolia*), cypress (*Cupressus* sp.), Monterey pine (*Pinus radiata*), and acacia (*Acacia* sp.). Species and size for inaccessible trees were estimated. Trees on slopes mapped as cut-and-fill were included in the count.

Table 3 Trees in the Project Impact Area

Species	Significant Trees Greater Than 12 Inches DBH	Trees Between 4 and 12 Inches DBH
Indigenous to the Project Area		
coast live oak	24	12
canyon live oak	2	5
live oak*	1	21
California bay	--	5
Toyon	--	2
Oregon ash		1
Exotic		
Cypress	2	--
Monterey pine	1	--
Acacia	5	10
TOTAL	35	56

DBH = diameter at breast height (4.5 feet above ground)

*inaccessible trees were estimated

Excavation, grading, and associated disturbance during demolition of the existing bridge and construction of the proposed new bridge would result in the removal and/or potential disturbance of vegetation on either side of the bridge. Potential impacts would be limited to small unpaved areas on the sides of Skyline Boulevard within the roadway right-of-way. Less than 1.0 acre would be exposed to this type of disturbance and potential vegetation removal. Construction activities could result in the removal of Monterey pines, Monterey cypress, and several small coastal live oaks. None of these trees constitute "heritage trees" under the San Mateo County Heritage Tree Ordinance due to their type and/or size (San Mateo County Ordinance, Section 1100, Ordinance No. 2427, 1977). Approximately 35 Significant Trees (defined as trees greater than 12-inch diameter at breast height pursuant to Section 12, 012 of the County Significant Tree Ordinance) may require removal; of these, 27 are oak trees, are native to the area. Understory vegetation would also be removed. Pursuant to Section 12, 024 of the County Significant Tree Ordinance, when construction is complete, oak trees (five [5]-gallon-size stock) would be planted in and around the Project impact area to replace those removed at a ratio of 3:1, resulting in no net loss of oak trees. In addition, non-native significant trees would be replaced with native trees (as determined by the Planning Director) also at a ratio of 3:1 (San Mateo County, Section 12000). Planting would take place at the onset of the rainy season to ensure water supply. The removal and/or disturbance of associated tree and understory plant species would not be significant due to the small area of potential impact.

Mitigation Measure BIO-12: The County will develop a Restoration, Monitoring, and Reporting Plan (RMRP) prior to Project implementation. The RMRP will provide details of restoration and enhancement activities, monitoring, and reporting. RMRP elements will include identification of the areas in which restoration will occur, specifics on removal of any existing vegetation that must be accomplished, details of site preparation, species and sizes of material to be planted, irrigation options as needed, performance criteria, frequency and duration of monitoring, reporting requirements, and interventions to be implemented if performance criteria are not met.

f) The Project site is not covered by a Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. No impact would occur.

3.5 CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☒	☐
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐
d. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

DISCUSSION

a) The existing bridge was built in 1924, and the dam upon which it stands was built between 1886 and 1890. The dam is important in the history of large concrete dam construction due to the fact that its builder pioneered construction techniques that later came into more general usage. The appropriate theme for the dam is engineering and technology history. The dam is listed on the National Register of Historic Places (NRHP), California Inventory of Historic Resources, and California Register of Historic Resources.

The dam (although not the road bridge above it) is also listed on the County's Historical Resources Inventory, as mandated in the County General Plan's "Historical and Archaeological Resources" Element (1986). As such, the Crystal Springs Dam Bridge Replacement Project (relative to its impact to the historic integrity of the dam) was reviewed and approved by the County Historic Resource Advisory Board on August 20, 2008. Their action concluded that the road bridge reconstruction project would pose no adverse or significant impact on the historic integrity of the dam (Caltrans 2008b).

On September 26, 2008, Caltrans transmitted a Historic Property Survey Report (HPSR) and Finding of Effect report for this Project to the State Historic Preservation Officer (SHPO). The HPSR reported that the dam had previously been determined eligible for listing on the NRHP, and the bridge was determined not eligible for listing on the NRHP. The HPSR determined that the vista point is not eligible for the NRHP. Caltrans requested the SHPO's review and concurrence with this determination and with the finding of no adverse effect to historic properties as a result of the proposed Project. In accordance with the January 2004 Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California SHPO, and the Caltrans, the SHPO was afforded 30 days to review and comment on the HPSR and an additional 30 days to review and comment on the FOE report. The 60-day total passed, and the SHPO did not comment on this project. Therefore, in accordance with Stipulations VIII.C.5.a. and X.B.1.b. of the Programmatic Agreement, on December 8, 2008 Caltrans assumed SHPO concurrence with the conclusions of the HPSR and FOE report. The correspondence is included in Appendix A of this environmental document.

The bridge is not listed on the California Inventory of Historic Resources or California Register of Historic Resources. Bridge replacement would not affect the historic integrity of the dam, as the planned construction would not affect the core characteristics that make the dam significant. The bridge has no strong associations with significant historic events or persons involved with the dam's existence. The dam would continue its function as a dam for urban water supply, remain in the same location, retain the same design, have a similar setting, and retain its historic workmanship, materials, feeling, and association, regardless of implementation of the proposed Project. The dam would remain eligible for listing in the

NRHP and CRHR. The Project would not cause a substantial adverse change in the significance of a historical resource. The impact would be less than significant.

b) A Historic Context and Archaeological Survey Report (HCAS) was prepared for the SFPUC and the San Francisco Planning Department for the Lower Crystal Springs Dam Improvements Project in March 2007 (ENTRIX/MSE 2007). This report includes background research and results of a field survey conducted in February 2006 and September 2006, respectively. The Area of Potential Effect (APE) included the Lower Crystal Springs Dam and surrounding area, encompassing the Crystal Springs Dam Bridge Replacement Project site. Cultural resource research and Native American consultation identified no archaeological sites within the Project site. In addition, site surveys conducted between September 8 and September 23, 2006, did not locate any new prehistoric sites or isolated resources within the Project area. The potential for unidentified buried resources to be found during grading activities does exist, although this potential is extremely low due to the steep slopes and the likelihood that these areas were disturbed during previous dam and bridge construction activities. In addition, the depth of construction would not impact previously disturbed soils as the north and south approaches would be raised 7 feet using fill material. Although no impacts would occur to known archaeological resources, Mitigation Measure CR-1 is required to ensure Project impacts to unknown resources, should they be discovered during Project construction, remain less than significant.

Mitigation Measure CR-1: If, at any time, archaeological resources are identified within the Project area, the Contractor(s) excavations within 50 feet of the find shall be temporarily halted or diverted until the discovery is examined by a qualified archaeologist. The archaeologist shall notify the Contractor to determine the procedures to be followed before construction is allowed to resume at the location of the find. If disturbance of the archaeological site cannot be avoided, data recovery within the affected area shall be conducted by a certified archaeologist in accordance with CEQA Guidelines Section 15064.5 so as to record and preserve the significant characteristics of the site.

c) No known fossils sites are present in the Project Area (P. Holroyd, pers. comm., 2007), and given the low paleontological sensitivity of the underlying geologic formation, construction excavation and grading at this site would not likely encounter paleontological resources. This area does not contain unique geological resources. Impacts would be less than significant.

d) A site records search and survey that were conducted yielded no evidence that the construction site contains human remains, and because the area has been disturbed in the past, construction would not likely disturb any human remains (Caltrans 2008b). Impacts would be less than significant.

3.6 GEOLOGY AND SOILS

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii. Strong seismic ground shaking?	☐	☐	☒	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☐	☒	☐
b. Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c. Be located on 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?	☐	☐	☒	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

DISCUSSION

a) **i and ii.** The State of California Special Studies Zones Map for the San Mateo quadrangle (Appendix B) indicates that the entire Project area is located in close proximity to the San Andreas Fault rift zone that runs roughly parallel to I-280. The objective of the proposed Project is to design and construct a new bridge, designed to meet the current seismic codes that would withstand the MCE of magnitude 8.5. The new bridge would be expected to maintain its structural integrity during such an earthquake or other strong seismic ground shaking. The proposed Project would result in a beneficial effect in that it would replace the existing bridge, which could fail during a large earthquake. Development of the proposed new seismically sound bridge would substantially reduce the potential for this type of damage to occur. This impact would be less than significant.

iii and iv. The existing roadway on Skyline Boulevard contains slopes of less than 15 percent gradient. The gradient of the reconstructed structure and roadway approaches would remain less than 15 percent. Existing side slopes above San Mateo Creek at the location of the existing dam and bridge range from moderate to relatively steep. In some locations, these slopes are greater than 15 percent. The San Mateo County Geotechnical Hazard Synthesis Map indicates that slope stability in the Franciscan Complex is poor to good (Leighton & Associates 1973). According to this mapping, however, there is no evidence that landslides have occurred on or in the immediate vicinity of the Project site. The existing slopes on and adjacent to the existing bridge are believed to be stable at their present gradient as these slopes were constructed in 1923 for the existing bridge abutments and have been stable for 68 years (Wahler & Associates 1992).

The proposed Project would result in localized effects to the upper slopes of the San Mateo Creek ravine during the installation of the new bridge abutments. These effects would not significantly modify or affect the natural drainage channel of this creek due to the distance of the abutments from the creek. The proposed Project could, however, potentially result in unstable slope conditions at the new bridge

abutments due to the existence of slopes greater than 15 percent. In addition, potential settlement of fill placed in the roadway approaches on either side of the bridge could result in uneven conditions, if not engineered and properly compacted. Therefore, San Mateo County has required its contractors to design the new bridge in accordance with the requirements of the geotechnical report prepared for the Project (Wahler Associates 1992). Roadway fill and pavement adjacent to bridge abutments are required to be designed to account for anticipated settlement, in accordance with the Caltrans Highway Design Manual. This impact would be less than significant.

b) The Project would involve the re-construction of the approach way road prism to conform to the new bridge profile. In these areas, some roadway side slopes that are presently vegetated would be disturbed, which could result in substantial soil erosion or the loss of topsoil. Therefore, the potential for soil erosion and loss of topsoil would result in a significant impact and Mitigation Measure GEO-1 would be required to reduce this impact to less than significant.

Mitigation Measure GEO-1: The County will implement the BMPs and conservation measures detailed in the County of San Mateo Watershed Protection Program's Maintenance Standards (San Mateo County 2004) to prevent erosion and siltation. The County will also prepare and implement a Stormwater Pollution Prevention Plan (SWPPP), as required by the NPDES General Construction permit. Both the San Mateo County and SWPPP BMPs will outline any and all measures needed to control stormwater or construction water runoff to prevent erosion, protect habitat, and eliminate or reduce water and soil pollution. These BMPs will be written and approved by San Mateo County and San Mateo Countywide Stormwater Pollution Prevention Program prior to implementation of construction activities. Implementation of the BMPs will be monitored and ensured by a County approved environmental monitor.

c) As stated above, the San Mateo County Geotechnical Hazard Synthesis Map indicates that slope stability in the Franciscan Complex is poor to good, but there is no evidence that landslides have occurred on or in the immediate vicinity of the Project site (Leighton & Associates 1973). The existing slopes on and adjacent to the existing bridge are believed to be stable at their present gradient. The Project location is not an area prone to subsidence, landslide, or severe erosion. The bridge abutments are designed on spread footings supported on competent bedrock. Abutment walls would be designed to withstand both seismic and lateral earth pressures, and drainage is designed behind the abutment walls to prevent the buildup of hydrostatic forces. Impacts would be less than significant.

d) On-site soils have a low to moderate expansion potential. Impacts from constructing on expansive soils therefore would be less than significant.

e) The Project does not involve the use of septic tanks or alternative waste water disposal systems, nor would it result in an increase in wastewater. No impact would occur.

3.7 GREENHOUSE GAS EMISSIONS

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment, based on any applicable threshold of significance?	☐	☒	☐	☐
b. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

DISCUSSION

a) The California Air Resources Board (CARB) has released preliminary draft recommended approaches for setting interim significance thresholds for greenhouse gases under CEQA (CARB 2008). CARB recommends an approach to construction-related greenhouse gas assessment that is based on meeting a set of performance standards, but it has not yet identified such standards. San Mateo County also has not established performance standards or significance thresholds for greenhouse gas emissions. Therefore, this analysis uses standards established for other purposes, such as vehicle and equipment engine efficiency and waste recycling and reuse. Mitigation Measure AIR-2, above, requires that equipment used in earthwork be tuned and maintained to the manufacturer's specification to maximize efficient burning of vehicle fuel and requires minimizing exhaust emissions from truck idling through efficient scheduling. Mitigation Measure UTIL-1, discussed below in Section 3.3.17, requires preparation and implementation of a waste management or recycling plan that will include actions to reuse or recycle construction debris and clean excavated soil and divert some inert solids from disposal in a landfill. This would reduce greenhouse gas emissions associated with energy-intensive material extraction and production as well as methane emission from landfills. With implementation of these measures, the Project would meet performance standards for construction equipment based on manufacturer recommendations, and for waste recycling and reuse based on San Mateo County's Waste Management Plan requirements. Therefore, based on CARB preliminary draft significance thresholds, this impact would be less-than-significant after mitigation.

b) Construction would contribute incrementally to regional increases in greenhouse gas emissions. San Mateo County has not adopted any plan, policy, or regulation for the purpose of reducing greenhouse gas emissions that would be applicable to Project activities. California Assembly Bill 32, also known as the California Global Warming Solutions Act of 2006, establishes statewide greenhouse gas emission reduction targets: by 2010, reduce emissions to 2000 levels; by 2020, reduce emissions to 1990 levels; and by 2050, reduce emissions to 80 percent below 1990 levels. The 1990 statewide greenhouse gas inventory was 427 million metric tons of CO_2-equivalent emissions (CARB 2007). Project construction would generate approximately 3,400 metric tons of CO_2-equivalent emissions (see Appendix C, Greenhouse Gas Emissions Worksheet). Although weekend work is not anticipated for this project, CO_2-equivalent emissions and other greenhouse gases were calculated to include one weekend day as a worst-case scenario. This would represent less than one-thousandth of a percent of the statewide total during the time these construction activities are carried out.

   Once operational, the Project would not result in increased greenhouse gas emissions over existing conditions. The Project would not conflict with the state's goals of reducing greenhouse gas emissions. This impact would be less than significant, and no mitigation measures would be required.

3.8 HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐
h. 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?	☐	☐	☒	☐

DISCUSSION

a) The Project would not involve the routine transport, use, or disposal of hazardous materials. No impact would occur.

b) Storage and use of hazardous materials at the construction site could result in the accidental release of hazardous materials such as oil, grease, or fuel, which could enter San Mateo Creek or the Crystal Springs Reservoir and degrade water quality. Mitigation Measure GEO-1 above requires that the County prepare and implement a SWPPP, which would contain BMPs that require protection measures for the temporary onsite storage of diesel fuels used during construction. These protection measures would detail requirements for secondary containment and berming of the diesel storage area (or any chemical storage areas) to contain a potential release and to prevent any such release from reaching an adjacent waterway or stormwater collection system. These measures would prevent significant hazards to the public or the environment from accidental releases of hazardous materials. The implementation of Mitigation Measure GEO-1 would make this impact less than significant.

c) The Project site is not located within 0.25 mile of a school. No impact would occur.

d) Review of the California Department of Toxic Substances Control EnviroStor database determined that the Project site is not included on any lists of hazardous materials sites, and nearby sites that are on such lists would not be affected by construction or operation of the Project (DTSC 2009). No impact would occur.

e) The Project site is not located within an airport land use plan, within 2 miles of a public airport, or in the vicinity of a private airstrip. No impact would occur.

f) See Item e)

g) The proposed Project could potentially interfere with emergency response and emergency evacuation during construction of the proposed new bridge. If not properly signed and controlled, the planned bridge closure during construction could potentially delay emergency response in the area. Mitigation Measure TRANS-1, discussed in Section 3.16, is a detour plan for rerouting bridge traffic during construction. Implementation of this measure would ensure that the temporary Project effects on emergency response and evacuation would be reduced to a less-than-significant level. While emergency response times to the Project vicinity could be temporarily increased even with this mitigation measure, the slight delays in emergency response times would not be considered significant and would not pose health hazards.

h) The use of construction equipment and temporary onsite storage of diesel fuel could pose a wildland fire risk in the Project area, which is classified by CAL FIRE as a "Wildland Area That May Contain Substantial Forest Fire Risks and Hazards." The time of the greatest fire danger is during the clearing phase, when people and machines are working among vegetative fuels that can be highly flammable; if piled onsite, the cleared vegetative materials could also become a fire fuel. Potential sources of ignition include equipment with internal combustion engines, gasoline powered tools, and equipment or tools that produce a spark, fire, or flame. Such sources include sparks from blades or other metal parts scraping against rock, overheated brakes on wheeled equipment, friction from worn or unaligned belts and drive chains, and burned out bearings or bushings. Sparking as a result of scraping against rock is difficult to prevent. The other hazards result primarily from poor maintenance of the equipment. Smoking by onsite construction personnel is also a potential source of ignition during construction.

   Regulations governing the use of construction equipment in fire-prone areas are designed to minimize the risk of wildland fires during construction activity. In accordance with the PRC, the construction contractor would be required to comply with the following legal requirements:

   - Earthmoving and portable equipment with internal combustion engines would be equipped with a spark arrestor to reduce the potential for igniting a wildland fire (PRC Section 4442).
   - Appropriate fire suppression equipment would 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 would be removed to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor would 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 would not be used within 25 feet of any flammable materials (PRC Section 4431).

   Implementation of these measures would ensure that Project construction would not expose people or structures to a significant risk of loss, injury, or death involving fires. Impacts would be less than significant.

3.9 HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c. 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?	☐	☐	☐	☒
d. 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?	☐	☐	☐	☐
e. 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?	☐	☐	☒	☐
f. Otherwise substantially degrade water quality?	☐	☐	☐	☒
g. 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?	☐	☐	☐	☒
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j. Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

DISCUSSION

a) Bridge construction activities on top of the dam could result in increased sediments or construction-related contaminants such as fuels and lubricants in stormwater runoff. Runoff could deposit these pollutants into adjacent waters on either side of the dam. This would be most likely to occur on the east (creek) side of the dam, as the existing parapet wall is shorter than on the west (reservoir) side of the dam. Bridge approach construction activities adjacent to the dam would result in ground disturbance and vegetation removal that could also increase sedimentation in adjacent waters. Surface runoff of sediments and other construction-related contaminants into adjacent waters would occur primarily during the winter rainy season. Additionally, accidental deposition of materials over the side of the dam could occur throughout the construction period if not properly controlled. Mitigation Measure GEO-1 above requires that the County implement the BMPs and conservation measures detailed in the County of San Mateo Watershed Protection Program's Maintenance Standards (San Mateo County 2004) to prevent erosion and siltation. In addition, the County would be required to prepare and implement a SWPPP that would include BMPs to minimize pollutants in stormwater runoff, including from erosion and the storage and use of hazardous materials. Implementation of these measures would ensure that the Project complies with applicable water quality standards and waste discharge requirements, and would reduce potential construction-related impacts to less than significant. Prior to construction the County shall require its contractors fence the boundary of the construction area with an Environmentally Sensitive Area (ESA) fence. The ESA fence is designed to contain construction activities within the fence and protect outside

areas from construction activities. No stockpiling of materials or any other activities shall be allowed outside of the fenced construction area. This fencing would serve to prevent the accidental deposition of materials over the side of the dam.

Project operation could result in an increase in surface runoff from the new bridge due to the increase in impervious surface. However, the proposed bridge is designed to slope to the east, directing roadway runoff away from the Lower Crystal Springs Reservoir and into San Mateo Creek downstream of the dam and bridge. Therefore, Project operation would not affect reservoir water quality. Because traffic on the bridge would not be expected to increase due to the Project, there would be no increase in vehicle-related pollutants deposited on the roadway. Therefore, the Project would not increase the volume of pollutants in surface runoff to San Mateo Creek. With implementation of Mitigation Measure GEO-1 and design criteria outlined above, the Project would not conflict with applicable water quality standards and waste discharge requirements, and operational impacts would be less than significant.

b) This project does not anticipate any groundwater impact. The bridge, piers, and abutment construction is on top of the dam, and the roadway approaches are to be raised 7 feet.

c) As stated above, the Project would increase the area of impervious surface on the bridge, but would be designed to direct roadway runoff away from the Lower Crystal Springs Reservoir and into San Mateo Creek downstream of the dam and bridge. Increases in runoff would not result in flooding or substantial erosion or siltation. The Project would also disturb existing vegetation, potentially altering drainage patterns and increasing erosion on vegetated slopes. The Contractor would implement the BMPs and conservation measures detailed in the County of San Mateo Watershed Protection Program's Maintenance Standards to prevent erosion and siltation. The Contractor would also be required to prepare and implement a SWPPP that would include BMPs to minimize pollutants in stormwater runoff. The Project would not substantially alter flows in a manner that would increase erosion, siltation, or flooding on- or off-site. Impacts would be less than significant.

d) See Item c)

e) The Project would slightly increase the amount of impervious surface at the Project site, but this would not create or contribute significant volumes of runoff water that would exceed the capacity of storm drainage systems or substantially increase sources of pollution. Stormwater runoff from the bridge would be directed into San Mateo Creek, which has enough capacity to accommodate increased runoff. The Project would not result in increased traffic on the bridge; therefore, it would not increase the levels of vehicle-related pollutants in runoff. Impacts would be less than significant.

f) The Project does not have components that would otherwise substantially degrade water quality. Therefore, no impact would occur.

g) The Project would not place any housing or other structures within a 100-year flood hazard area. Therefore, no impacts would occur.

h) See Item g)

i) Once constructed, the new bridge would generally not be exposed to flood waters as it has been designed to completely span both the existing spillway and the expanded width of the spillway that is being considered under the SFPUC Lower Crystal Springs Dam Improvements Project. The Project would not increase the risk of flood-related damage to the bridge. While drilling and grouting of holes in the top of the dam would be required to anchor foundations, no blasting would be performed. The objective of the proposed Project is to construct a new bridge designed to meet the current seismic codes that would withstand the MCE of magnitude 8.5. By improving the seismic safety of the bridge, the Project would

reduce the likelihood of dam failure due to the collapse of the bridge. Therefore, the Project would increase safety related to floods in the Project area. Impacts would be less than significant.

j) The elevation of the Project site and distance from any source of tsunamis (e.g., Pacific Ocean or San Francisco Bay) precludes the potential for inundation by a tsunami. Although seiches can occur in water bodies such as Crystal Springs Reservoir, no large seiches have been observed in the reservoir over the period of its operation. The Project would not increase the risk of seiches or mudflows, nor would it increase the use of the bridge such that more people could be exposed to the existing risk from these phenomena. Impacts would be less than significant.

3.10 LAND USE AND PLANNING

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Physically divide an established community?	☐	☐	☐	☒
b. 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?	☐	☐	☒	☐
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

DISCUSSION

a) The Project site is not located within an established community. The nearest residential areas are approximately 1,200 feet from the Project site on the east side of I-280. The Project would demolish and then replace an existing bridge. The Project would not result in any changes that would physically divide an established community either during construction or operation; therefore, no impacts would occur.

b) The proposed Project would not permanently result in the introduction of activities not currently found within the Project vicinity. No changes in existing land uses either at or outside of the Project site would occur. The existing adjacent land uses would remain the same as under existing conditions.

Construction activities could pose a temporary conflict with adjacent land uses, such as could occur with the generation of dust, noise, and temporary interruptions of traffic routes. Mitigation measures to ensure that these conflicts would not result in a significant effect are provided in the air quality, noise, and transportation discussions. Therefore, impacts would be less than significant.

c) There are no habitat conservation plans or natural community conservation plans that apply to the Project area. No impact would occur.

3.11 MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

DISCUSSION

a) Mineral Land Classification maps prepared by the California Department of Mines and Geology (1987, 1996) and the San Mateo County General Plan (San Mateo County 1986) indicate that no mineral resources are present in the area that would be affected by the Project. Therefore, the Project would not result in the loss of availability of a known mineral resource, and no impact would occur.

b) No mineral resources are present in the area that would be affected by the Project. Therefore, the Project would not result in the loss of availability of a locally important mineral resource recovery site, and no impact would occur.

3.12 NOISE

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Result in the exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b. Result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c. Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d. Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

DISCUSSION

a) Existing noise sources in the Project vicinity consist primarily of roadway noise from traffic along Skyline Boulevard and from I-280, which is located approximately 600 feet to the east of the site. The San Mateo County General Plan Community Noise Map (San Mateo County 1986) identifies the I-280 corridor as a "noise impact area," defined as an area with ambient Community Noise Equivalent Level (CNEL) greater than 60 (Charles Salter Associates Inc. 1978). The Project site falls just outside of this noise impact area. Other than traffic noise, there are no other significant noise sources at the site and the site is relatively quiet. Land uses in the Project vicinity that may be sensitive to increased noise levels include residential areas located approximately 1,200 feet away and the recreational areas along Sawyer Camp Trail.

   Once completed, the Project would not result in noise levels above existing conditions because the Project would not result in traffic increases. Impacts would be less than significant.

b) Construction and demolition would generate intermittent vibrations. The nearest sensitive receptor would be the residences 1,200 feet from the Project site. Construction vibration would attenuate to a less-than-significant level at these residences.

c) The Project would not result in increased traffic on Skyline Boulevard. Therefore, noise levels would be the same during operation as under existing conditions, and no impact would occur.

d) Construction activities would be expected to increase ambient noise levels at the Project site and in areas immediately adjacent to the site during the demolition and construction periods. Construction equipment could individually reach noise levels of up to 80 to 90 dB. Noise levels would vary throughout the day depending on the type of equipment in use at any one time.

   I-280 is located between the Project site and the residential areas. Because ambient noise levels along the I-280 corridor are already greater than 60 CNEL, it is very unlikely that residences in these areas would be able to hear construction activities at the Project site over the existing highway noise. This impact would be less than significant.

Project construction noise may also potentially be heard by recreationists using the lower end of the Sawyer Camp Trail, approximately 600 feet north of the site. This exposure to increased noise would be intermittent and short-term, and would occur only while users are arriving at and leaving from the trail head. Because the parking area at vista point just north of the bridge would be closed during construction, visitors would not be exposed to construction noise at closer distances. The short-term exposure of recreationists to increased noise levels would be a less-than-significant impact.

e) The Project is not located within an airport land use plan or within 2 miles of a public airport or private airstrip. Therefore, the Project would not expose people residing or working in the Project Vicinity to excessive airport-related noise levels. No impact would occur.

f) See Item e)

3.13 POPULATION AND HOUSING

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

DISCUSSION

a) Because no new residential or commercial uses are proposed as part of the Project, the only potential direct impact on population growth would be from construction workers assigned to the Project. Project construction would require a monthly average of up to 13 workers over the 24-month construction period. The existing construction labor pool of over 27,000 workers in San Mateo County and nearly 250,000 in the Bay Area (U.S. Census 2000) could readily support construction needs, and no direct impacts on population growth would occur.

   The Project would demolish and replace an existing bridge, and therefore would not extend roads or other infrastructure that could indirectly induce population growth. No indirect impacts on population growth would occur.

b) The Project Area is not located near existing housing; therefore, the Project would not displace any housing or people. No impacts would occur.

c) See Item b)

3.14 PUBLIC SERVICES

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection, police protection, schools, parks, or other public facilities?	☐	☒	☐	☐

DISCUSSION

a) During Project construction, there would be increased risk of wildfires, accidents, or spills associated with the operation of construction equipment. There could also be increased demand for police services as a result of additional people being present at the work site. Such increase in demand for services, if any, would be well within the capabilities of the existing public service providers. During the demolition portion of this project, the maximum size of the workforce is expected to be 13. The maximum size of the construction workforce expected during the bridge reconstruction is 40 people and construction would be temporary. The Project construction area is located close to fire and police services. The Project would not affect response times for these providers. Project construction would not require police services for traffic control. Additionally, fire suppression equipment would be required to be on board equipment with fuel tanks or at the construction site. The Project would not create the need for new or physically altered governmental facilities to accommodate increased demand for fire or police protection. The Project also would not increase the demand for or use of schools, parks, or other public facilities such as libraries and hospitals.

The project site is located directly above the Lower Crystal Springs Dam owned by the SFPUC. There are no existing septic tank, leachfield sewage disposal system, or municipal sewer or water systems that serve the existing bridge or adjacent overlook on the north side of the bridge. Electrical and water supply facilities exist for operation and maintenance of the Lower Crystal Springs Dam and associated pump house, adjacent to the bridge. There are no other public services or utilities that are extended to the project site and no other public facilities are known to exist, nor are planned for future development, within 500 feet of the project site.

A 230 kV overhead line belonging to PG&E is located above the bridge. Construction activities could potentially affect electrical lines located on the top of the dam, along the edge of the dam parapet wall. Overhead electrical lines crossing the dam could also potentially be damaged during excavation, if not properly identified and protected. Construction of the proposed project could result in a potentially significant impact if damage to electrical lines results in unplanned electrical outages in the area. The County is currently coordinating design efforts with PG&E and SFPUC. Both PG&E and SFPUC are aware of the project and will be given the opportunity to review the bridge plans and contract documents. Implementation of Mitigation Measure PS-1 would reduce the potential impact of unplanned interruptions in service to less than significant.

Mitigation Measure PS-1: Prior to initiating construction, San Mateo County shall require the construction contractor to contact the USA to identify and avoid (or protect) existing lines, cables, and other electrical facilities during construction activities to ensure the integrity of existing utility systems.

3.15 RECREATION

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b. Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☒	☐

DISCUSSION

a) The multipurpose separated recreational trail proposed as part of the Project would provide for improved pedestrian and bicycle travel over the bridge, both in terms of safety and in the quality of the experience with the increased separation from vehicle travel lanes. This improvement could result in a minimal increase in recreational use of the bridge. Impacts would be less than significant.

b) The Project would not require the construction or expansion of recreational facilities off-site. It would include one recreational facility (the improved bicycle and pedestrian path). This component of the Project would not have a significant adverse effect on the environment. Section 3.3.16, Transportation and Traffic, discusses potential traffic impacts resulting from the bicycle and pedestrian path.

3.16 TRANSPORTATION AND TRAFFIC

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Cause an increase in traffic which 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 the roads, or congestion at intersections) roadway vehicle volume or vehicle miles traveled?	☐	☒	☐	☐
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☒	☐	☐
c. 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?	☐	☐	☐	☒
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e. Result in inadequate emergency access?	☐	☒	☐	☐
f. Result in inadequate parking capacity?	☐	☐	☒	☐
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒

DISCUSSION

a) Once construction is completed, the new bridge would not generate additional traffic on Skyline Boulevard or on other roads in the Project vicinity. The traffic capacity of the new bridge would be essentially the same as the existing bridge. As stated above under Section 3.15, Recreation, the Project could result in a minimal increase in recreational use of the bridge due to the improved amenities. However, this increase would not be substantial in relation to existing recreational traffic. Project operation would not exceed level of service standards established by the San Mateo County Congestion Management and Transportation Planning Unit.

Project construction would require the temporary closure of Skyline Boulevard between Crystal Springs Road and Crystal Springs Regional Trail North to through traffic. This segment primarily serves recreational traffic and local traffic associated with the residential uses to the northeast and southeast of the bridge. Minor impacts on traffic patterns are anticipated during Project construction, such as at detour points where vehicles are diverted to alternate routes. Traffic could increase on designated alternate routes. These increases would not cause levels of service on these roads to exceed level of service standards established by the San Mateo County Congestion Management and Transportation Planning Unit, but could be substantial in relation to the existing traffic load and capacity of the street system. In addition, construction detours would be extended due to the staggered schedule to accommodate the SFPUC Lower Crystal Springs Dam Improvement Project. This would be a significant impact. Implementation of Mitigation Measures TRANS-1 and TRANS-2 would reduce this impact to less than significant.

Mitigation Measure TRANS-1: The County will implement traffic detour routes for the duration of Project construction (see Appendix G: Construction Detour Routes).

Signs and alternative routes will be advertised and posted for the public. The County will notify emergency service providers of these alternative routes prior to the start of construction to minimize impacts on emergency response times. The detour routes would be as follows:

South of the Bridge. Northbound traffic on Skyline Boulevard will be directed onto Highway 92 for vehicular traffic or Bunker Hill Drive for both vehicular and bicycle traffic. From there, traffic will be directed to northbound Polhemus Road (County Road 17). From Polhemus Road, traffic will be directed west on Crystal Springs Road, where it will meet with Skyline Boulevard north of the construction site. Expected detour length is 5 miles for vehicular traffic using Highway 92 or 3.6 miles for vehicular or bicycle traffic using Bunker Hill Drive.

North of the Bridge. Southbound traffic on Skyline Boulevard will be directed east on Crystal Springs Road. From there, traffic will be directed to southbound Polhemus Road (County Road 17). From Polhemus Road vehicular traffic will be directed west on Highway 92 or Bunker Hill Drive for both vehicular and bicycle traffic, where it will meet with Skyline Boulevard south of the construction site. Expected detour length is 5 miles for vehicular traffic using Highway 92 or 3.6 miles for vehicular or bicycle traffic using Bunker Hill Drive.

Bicycle traffic will have another detour option in lieu of using Bunker Hill Drive, which may be too steep for some bicyclists:

Detour for bicycle traffic coming from north of the Crystal Springs Dam Bridge either via the terminus of the Sawyer Camp Trail or Skyline Boulevard. Southbound bicycle traffic on Skyline Boulevard or Sawyer Camp Trail will be directed east (left turn or straight respectively) onto Crystal Springs Road. From there, bicycle traffic will be directed southbound (right turn) onto Polhemus Road which then becomes Ralston Avenue near the Highway 92 interchange. Immediately south of the Ralston Avenue/Highway 92 interchange, bicycle traffic will be directed west (right turn) onto the Ralston Recreational Trail (a 1-mile-long paved recreational trail) which runs parallel to Highway 92 and connects to Cañada Road via a bicycle/pedestrian bridge that crosses over I-280 south of the construction site. The total bicycle traffic detour length is 4 miles. If crossing over the Crystal Springs Dam Bridge from the Sawyer Camp Trail terminus (at intersection of Crystal Springs Road and Skyline Boulevard immediately north of the bridge) to Canada Road, the distance is 2.5 miles.

Detour for bicycle traffic coming from south of the bridge from Highway 92. Bicycle traffic traveling in an easterly direction on Highway 92, (coming down from the top of the Highway 92/Skyline Boulevard intersection) will have the option to either make a left turn (northbound) onto Skyline Boulevard at the lighted signal intersection on Highway 92 and Skyline Boulevard (located immediately east of SFPUC's Crystal Springs Reservoir and west of I-280) and continue northbound towards the Bunker Hill Drive detour (right turn) which connects to Polhemus Road or have the option to continue easterly on Highway 92 and make a right turn (southbound) onto Cañada Road and connect to the Ralston Recreational Trail detour described above.

Mitigation Measure TRANS-2: The County will coordinate construction schedules and traffic management plans with the SFPUC to minimize disruption to traffic flow on Crystal Springs Road and all nearby streets from multiple construction projects.

b) See Item a)

c) The Project would have no impact on air traffic patterns.

d) The design of the Project would not increase hazards. The Project would have the beneficial effect of constructing a new bridge designed to meet the current seismic codes that would withstand the MCE of magnitude 8.5. The new bridge would be expected to maintain its structural integrity during such an earthquake. This would make the bridge less hazardous for drivers. Additionally, construction of a separated, improved bicycle and pedestrian path on the bridge would reduce hazards for recreationists using the bridge. The Project would not result in incompatible uses on the bridge. No impact would occur.

e) The proposed Project could potentially interfere with emergency response and emergency evacuation during construction of the proposed new bridge. If not properly signed and controlled, the planned bridge closure during construction could potentially delay emergency response in the area. This would be a significant impact. Implementation of Mitigation Measure TRANS-1 would ensure that the temporary effect of the Project on emergency response and evacuation would be reduced to a less-than-significant level.

f) The Sawyer Camp Trail, north of the intersection of Skyline Boulevard and Crystal Springs Road, would remain open during construction. During construction, the roadside parking area at the vista point, as well as off-road parking along Skyline Boulevard across from the vista point would not be accessible. This area normally accommodates a total of 15 to 16 vehicles. This parking is well-used, particularly on weekends. Although closure of this area would reduce available parking during Project construction, this effect would be temporary. Recreationists using the Sawyer Camp Trail currently park informally along both shoulders of Skyline Boulevard north of Crystal Springs Road, and on Crystal Springs Road east of Skyline Boulevard, and could continue to do so to access Sawyer Camp Trail during Project construction. This impact would be less than significant.

g) Project implementation would not permanently change the existing or planned transportation network in San Mateo County, and would therefore not conflict with policies, plans or programs related to transit, bicycle or pedestrian travel. Bridge replacement would not result in a long-term increase in transit demand. No impact would occur.

3.17 UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b. 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?	☐	☐	☐	☒
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g. Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☒	☐	☐

DISCUSSION

a) The Project would not generate wastewater requiring treatment or requiring the construction of new wastewater treatment facilities. Therefore, no impacts would occur.

b) See Item a)

c) No stormwater drainage facilities would be constructed as part of the Project, and none would be required. Effects of new impervious surfaces on flows in San Mateo Creek are discussed in detail in Section 3.3.9, Hydrology and Water Quality. No impact would occur.

d) Project construction would require water to wash dirt from construction equipment and to wet the ground at the construction site to suppress airborne dust. Existing water supplies would be sufficient to serve this need. The Project would not generate a long-term demand for water. No new or expanded entitlements would be needed; therefore, no impact would occur.

e) The Project would not generate wastewater requiring treatment. Therefore, no impacts would occur.

f) Construction would result in an estimated 4,300 cubic yards of demolition and excavation waste. These materials would be disposed of in a nearby landfill, most likely Ox Mountain Sanitary Landfill in Half Moon Bay, which has adequate remaining permitted capacity (31 million cubic yards) (California Integrated Waste Management Board 2007). Impacts on landfill capacity would be less than significant, and no mitigation measures would be required.

g) San Mateo County requires the preparation of a Waste Management Plan for construction projects where the cost of work would exceed $250,000, as determined by the Building Official. A Waste Management Plan is necessary to demonstrate compliance with County Ordinance 04099 that requires covered projects

to salvage, reuse or recycle 100 percent of inert solids (asphalt, brick, concrete, dirt, fines, rock, sand, soil, and stone) and at least 50 percent of the remaining construction and demolition debris generated by the project. This ordinance was adopted to assist the county to meet the standards of AB 939 (San Mateo County 2002).

The Project would generate up to 4,300 cubic yards of solid waste. The Project does not include plans to divert any portion of the excavated spoils from landfills; therefore, it is not in compliance with San Mateo County's Waste Management Plan requirements. This would be a significant impact. Implementation of Mitigation Measure UTIL-1 would reduce the impact on compliance with statutes and regulations related to solid waste to a less-than-significant level.

Mitigation Measure UTIL-1: The Contractor will develop a waste management or recycling plan that include procedures to identify the types of debris that would be generated by the Project and describe how all waste streams will be handled, actions to reuse or recycle construction debris and clean excavated soil to the extent possible, and actions to divert at least 50 percent of inert solids (asphalt, brick, concrete, dirt, fines, rock, sand, soil, and stone) from disposal in a landfill.

3.18 MANDATORY FINDINGS OF SIGNIFICANCE

Does the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b. Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☒	☐	☐
c. Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

DISCUSSION

a) As discussed in Section 3.4, Biological Resources, construction of this Project has the potential to adversely affect sensitive species and habitats during the construction phase of the Project. However, Mitigation Measures BIO-1 through BIO-11 (described in Section 3.4) would ensure that impacts are reduced to the less-than-significant level. No impacts would occur to federally protected wetlands. The California red-legged frog breeding pool on top of the dam would be protected during bridge demolition and would not be removed by the proposed Project. In addition, the County would initiate enhancement of a minimum of approximately 0.25 acre of occupied California red-legged frog and San Francisco garter snake habitat prior to the start of construction. As a result, the Project would not result in an impact that would substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of a rare or endangered plant or animal.

   As discussed in Section 3.5, Cultural Resources, the project would not eliminate important examples of the major periods of California history or prehistory. The Project site does not contain known archaeological resources. The dam upon which the bridge stands is listed on the NRHP, California Inventory of Historic Resources, and California Register of Historic Resources; however, replacement of the bridge on the dam would not eliminate or otherwise result in an adverse effect on the historic integrity of the dam. Therefore, the Project would not eliminate important examples of the major periods of California history of prehistory and this impact would be less than significant with implementation of Mitigation Measure CR-1.

b) In addition to the proposed Project, there are three other projects proposed within the Project vicinity. The SFPUC Lower Crystal Springs Dam Improvements Project is scheduled to occur at the Project site and downstream of the dam between the proposed Project's demolition and reconstruction phases. Another SFPUC project, the New Crystal Springs Bypass Tunnel (New Crystal Springs Bypass Tunnel) Project is currently being constructed to provide redundancy to the existing Crystal Springs Bypass Pipeline, and is scheduled to be completed in the fall of 2011 (SFPUC 2009). Additionally, San Mateo County is contemplating the development of the northernmost portion of the Crystal Springs Regional Trail North south of the existing bridge along the Crystal Springs Reservoir on SFPUC watershed lands. When viewed in combination with the effects of the proposed Project, implementation of these projects could

result in cumulative impacts. Because the proposed Project would have no impact on agriculture and forest resources, mineral resources, and population and housing, it would not contribute to cumulative impacts on these resources.

AESTHETICS

The SFPUC dam project would have aesthetic impacts similar to those of the proposed Project and would be visible from the same points as the bridge. Implementation of both projects would cause a longer temporary closure of the vista point. The cumulative effects of the projects would not affect the vividness, intactness, or unity of the site and its surroundings and would not contribute to a cumulatively considerable impact on aesthetics.

AIR QUALITY

Similar to the proposed Project, construction-related emissions from each of these cumulative projects could contribute to local and regional air pollution effects. When viewed in combination with the effects of the proposed Project, implementation of these projects could result in cumulative impacts. Because they are located within BAAQMD jurisdiction, these projects would be required to comply with BAAQMD regulations and adhere to the BAAQMD CEQA guidelines. Implementation of the BAAQMD measures for reducing construction emissions would reduce these projects' impacts to less-than-significant levels. The County would implement Mitigation Measures AIR-1 and AIR-2, further reducing the proposed Project's contribution to this cumulative impact.

BIOLOGICAL RESOURCES

The California red-legged frog breeding pool on top of the dam would likely be eradicated by the SFPUC for the Lower Crystal Springs Dam Improvements Project. (The SFPUC has initiated consultations with the USFWS and CDFG in order to identify any mitigation measures necessary to address impacts associated with the SFPUC dam project.) Additional impacts to California red-legged frog habitat in the Crystal Springs area could occur from the New Crystal Springs Bypass Tunnel project, which has also proposed mitigation measures to reduce its impact to less than significant.

As described in Section 3.4, Biological Resources, the breeding pool on top of the dam would be protected during construction of the proposed Project in case the SFPUC project does not go forward. Implementation of this and other mitigation measures listed in Section 3.4 would reduce the proposed Project's cumulative contribution to this impact to a less-than-significant level.

CULTURAL RESOURCES

Although the proposed Project is not expected to encounter archaeological resources, disturbance of previously undiscovered resources would be a significant impact. The SFPUC dam project and New Crystal Springs Bypass Tunnel project include excavation, and could result in significant impacts on archaeological resources within the Project vicinity. When viewed in combination with the effects of the proposed Project, implementation of these projects could result in cumulative impacts. If these projects resulted in potentially significant impacts on archaeological resources, they would be required to implement mitigation measures to reduce these impacts to less-than-significant levels. Implementation of Mitigation Measure CR-1 would reduce the proposed Project's contribution to this potential cumulative impact.

GEOLOGY, SOILS, AND SEISMICITY

The proposed Project would have less-than-significant impacts after mitigation related to geology, soils, and seismicity. Implementation of Mitigation Measure GEO-1 would reduce the proposed Project's contribution to this potential cumulative impact. These types of impacts are generally site-specific and depend on local geologic and soil conditions. The cumulative projects could result in increased erosion within the Crystal Springs/San Mateo Creek watershed. When viewed in combination with the effects of

the proposed Project, implementation of these projects could result in cumulative impacts. These projects would be required to implement mitigation measures to reduce potentially significant erosion impacts, reducing their contribution to this cumulative impact.

GREENHOUSE GAS EMISSIONS

Similar to the proposed Project, construction-related emissions from each of these cumulative projects would generate greenhouse gases that may have a significant effect on the environment. When viewed in combination with the effects of the proposed Project, implementation of these projects could result in cumulative impacts. These projects would be required to comply with BAAQMD regulations as well as San Mateo County Waste Management Plan requirements. Implementation of the BAAQMD measures for reducing construction emissions and Waste Management Plans for the reuse or recycling of construction waste would reduce these projects' contributions to this cumulative impact. The County would implement Mitigation Measures AIR-1, AIR-2, and UTIL-1, reducing the proposed Project's contribution to this cumulative impact to less than significant.

HAZARDS AND HAZARDOUS MATERIALS

The proposed Project would have a less-than-significant impact on emergency response in the Project vicinity after implementation of Mitigation Measure GEO-1 and TRANS-1. Both the SFPUC dam project and New Crystal Springs Bypass Tunnel project would result in road and/or lane closures that could contribute to a cumulatively considerable impact on emergency response. These projects would implement traffic detour plans and would coordinate with local emergency response providers to inform them of closures prior to the start of construction. Implementation of these measures would reduce these projects' contributions to this cumulative impact to less than significant.

HYDROLOGY AND WATER QUALITY

The proposed Project could result in increased sediments or construction-related contaminants in stormwater runoff. Implementation of Mitigation Measure GEO-1, which includes the preparation and implementation of a SWPPP that would minimize pollutants, would reduce the proposed Project's contribution to this potential cumulative impact. The cumulative projects could result in increased sedimentation or contamination within the Crystal Springs/San Mateo Creek watershed. When viewed in combination with the effects of the proposed Project, implementation of these projects could result in cumulative impacts. These projects would be required to implement mitigation measures, including SWPPPs, to reduce potentially significant impacts on stormwater runoff, reducing their contribution to this cumulative impact to less than significant.

LAND USE AND PLANNING

Similar to the proposed Project, construction-related emissions from each of these cumulative projects could result in temporary increases in dust, noise, and traffic interruptions. When viewed in combination with the effects of the proposed Project, implementation of these projects could result in cumulative impacts. Implementation of mitigation measures for reducing construction dust emissions and noise and for providing traffic detours would reduce these projects' impacts to less-than-significant levels. The County would implement Mitigation Measures AIR-1, AIR-2, and TRANS-1, reducing the proposed Project's contribution to this cumulative impact.

NOISE

The proposed Project would have less-than-significant impacts from construction noise. The cumulative projects could result in temporary construction noise impacts. When viewed in combination with the effects of the proposed Project, implementation of these projects could result in cumulative impacts. These projects would be required to implement mitigation measures to reduce potentially significant noise impacts, reducing their contribution to this cumulative impact to less than significant.

PUBLIC SERVICES

During Project construction, there would be increased risk of wildfires, accidents, or spills associated with the operation of construction equipment, or increased demand for police services as a result of additional people being present at the construction site. Fire suppression equipment would be required to be on board equipment with fuel tanks or at the construction site. Impacts would be less than significant, and not cumulatively considerable. Each of the cumulative projects is expected to have similar impacts; therefore, any cumulative impacts would be less than significant.

RECREATION

The proposed separated 15-foot path on the new bridge would provide for a safe connection for pedestrians, bicyclists, and other users between the proposed Crystal Springs Regional Trail North and the Sawyer Camp trail, and would allow for a future continuous north-south connection. After the Crystal Springs Regional Trail North project is complete, the bridge could experience heavier use by recreationists. However, this would not result in a cumulatively considerable impact because the new recreational facilities at the proposed trail and on the new bridge would accommodate all future increases in recreational use.

TRANSPORTATION AND TRAFFIC

Project construction would require the temporary closure of Skyline Boulevard between Crystal Springs Road and Crystal Springs Regional Trail North to through traffic. Minor impacts on traffic patterns are anticipated during Project construction, such as at detour points where vehicles are diverted to alternate routes. Traffic could increase on designated alternate routes. These increases would not cause levels of service on these roads to exceed level of service standards established by the San Mateo County Congestion Management and Transportation Planning Unit, but could be substantial in relation to the existing traffic load and capacity of the street system. Each of the cumulative projects would also result in temporary road closures, and it is likely that some road closures would be in effect within the Project vicinity for several years, throughout the construction periods of each Project. This would result in cumulatively considerable impacts on transportation and traffic. Implementation of Mitigation Measure TRANS-1 and Mitigation Measure TRANS-2 would reduce the Project's contribution to this cumulative impact to less than significant.

UTILITIES AND SERVICE SYSTEMS

The proposed Project would result in less-than-significant impacts related to solid waste disposal after implementation of Mitigation Measure UTIL-1. The SFPUC dam project and New Crystal Springs Bypass Tunnel project would involve excavation that would result in construction waste. It is not known whether the Crystal Springs Regional Trail North project would generate substantial construction waste. Each of these projects could potentially generate waste that would contribute to a cumulative impact on local planning to reduce landfill waste; however, they would be required to comply with San Mateo County's Waste Management Plan requirements. Implementation of Waste Management Plans for the reuse or recycling of construction waste would reduce these projects' contributions to this cumulative impact to less than significant.

c) The project's impacts on the human environment would occur primarily during construction. These impacts would include air quality, noise, traffic and transportation, and recreation. All of these impacts would be less than significant either on their own or with the implementation of avoidance or minimization measures. As a result, the project's potential impact to human beings would be less than significant.

SECTION 4

List of Preparers

County of San Mateo, Department of Public Works

James C. Porter, PE, Director of Public Works

Gilles Tourel, Senior Civil Engineer

Jean Higaki, Transportation Systems Coordinator

Brent Spencer, Biologist

ENTRIX, Inc.

Kate Kissinger, Senior Project Environmental Planner

Alexandra Kostalas, Staff Environmental Planner

Jennifer Grady, Staff Environmental Planner

Iris Eschen, Production Supervisor

PB Americas

Johnny Kuo, Supervising Engineer

Swaim Biological, Inc.

Karen Swaim, Founder and Herpetologist

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SECTION 5

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APPENDIX A

Correspondence

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: SYLVIA FUNG
Office Chief, Local Assistance

Date: December 9, 2008

Attn: BORIS DEUNERT, Senior Environmental Planner

File: 04-SM-0-CR
BROS-0081 (011)
Crystal Springs Dam
Bridge replacement
San Mateo County

From: JENNIFER DARCANGELO
Chief, Office of Cultural Resource Studies

Subject: Section 106 compliance for the Crystal Springs Dam Bridge replacement project in San Mateo County

A Historic Property Survey Report (HPSR) and Finding of Effect (FOE) report for this project were transmitted to the State Historic Preservation Officer (SHPO) for review and concurrence on September 26, 2008. These reports were received by the Office of Historic Preservation on October 1, 2008. In accordance with the January 2004 *Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation* (PA), the SHPO was afforded 30 days to review and comment on the HPSR and an additional 30 days to review and comment on the FOE report. The 60-day total has now passed, and the SHPO did not comment on this project. Therefore, in accordance with Stipulations VIII.C.5.a. and X.B.1.b. of the PA, SHPO concurrence with the conclusions of the HPSR and FOE report is assumed. The FOE report concluded that this project will have no adverse effect on historic properties. No further consultation with the SHPO is required unless there are later project changes that would require expansion of the Area of Potential Effect for this project.

The Crystal Springs Dam was previously determined eligible for listing on the National Register of Historic Places, while the bridge was previously determined ineligible for National Register listing. The HPSR evaluated the pumping station, outlet towers, and vista point, concluding that the pumping station is eligible for National Register listing while the outlet towers and vista point are ineligible. Please note that SHPO concurrence with this determination is assumed for this project only. Under Section 106 of the National Historic Preservation Act, consultation with the SHPO will be required for any future project that has the potential to affect any of these properties.

If you have any questions or need any additional information, please contact me or Andrew Hope of my staff at (916) 654-5611 or andrew_hope@dot.ca.gov.

CC: OCRS files

DEPARTMENT OF TRANSPORTATION
DIVISION OF ENVIRONMENTAL ANALYSIS, MS 27
1120 N STREET
P. O. BOX 942874
SACRAMENTO, CA 94274-0001
PHONE (916) 653-7507
FAX (916) 653-7757
TTY (916) 653-4086

Flex your power!
Be energy efficient!

September 26, 2008

Mr. Milford Wayne Donaldson, FAIA
State Historic Preservation Officer
Office of Historic Preservation
P. O. Box 942896
Sacramento, CA 94296-0001

04-SM-0-CR
Local Assistance
Federal ID:
BROS-0081 (011)
Crystal Springs Dam Bridge
Replacement Project

Dear Mr. Donaldson:

Subject: Determination of Eligibility and Finding of No Adverse Effect for the Crystal Springs Dam Bridge Replacement Project, San Mateo County

The California Department of Transportation (Caltrans) is initiating consultation with the State Historic Preservation Officer (SHPO) regarding our determination of eligibility and finding of effect for the above referenced project. This consultation is undertaken in accordance with the January 2004 *Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation* (PA).

Caltrans is transmitting this as a federal agency, following the provisions of the *Memorandum of Understanding (MOU) between the Federal Highway Administration, California Division and the California Department of Transportation State Assumption of Responsibility for Categorical Exclusions*, which became effective on June 7, 2007. The MOU was signed pursuant to Section 6004 of the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, which allows the Secretary of Transportation to assign, and the State of California to assume, responsibility for most NEPA Categorical Exclusion determinations. For those projects, the State may also be assigned FHWA's responsibilities for environmental consultation and coordination under other federal environmental laws. By statute, the State is deemed to be a Federal agency for these assigned responsibilities. In that this project is covered by the above referenced MOU, FHWA has assigned, and Caltrans has assumed, FHWA responsibility for environmental review, consultation, and coordination on this project. Please direct all future correspondence on this project to Caltrans.

Enclosed please find a Historic Property Survey Report (HPSR) and Finding of Effect report (FOE) for the proposed undertaking. We are consulting with you under Stipulation VIII.C.5 of the PA, which requires that Caltrans seek SHPO concurrence on our determinations of eligibility for historic properties, and Stipulation X.B.1.a, which requires your concurrence with a finding of no adverse effect.

In conjunction with Caltrans, the County of San Mateo is proposing to demolish the existing Crystal Springs Dam Bridge (#35C-0043), situated on top of the Lower Crystal Springs Dam, with a new structure. A detailed project description can be found on pages one and two of the HPSR and on pages three and four of the FOE.

Identification and evaluation efforts for the proposed undertaking (summarized on pages three and four of the HPSR) resulted in the identification of five properties within the project's Area of Potential Effect (APE) as follows:

- The Crystal Springs Dam Bridge (#35C-0043)
- The Lower Crystal Springs Dam
- The Crystal Springs Pumping Station
- Outlet Towers No. 1 and No. 2
- Vista Point

The Crystal Springs Dam Bridge was previously determined not eligible for the National Register of Historic Places (National Resister) through consensus determinations in 1989 and 1997. The Lower Crystal Springs Dam was determined to be eligible for the National Register through the same consensus determinations. It is eligible under Criteria A and C at the national level of significance; the period of significance is 1886-1890. The Crystal Springs Dam Bridge is not a contributing element of the historic Lower Crystal Springs Dam.

Caltrans evaluated the Crystal Springs Pumping Station for the current project and determined that it is individually eligible for the National Register under Criteria A and C. Caltrans determined that Outlet Towers Nos. 1 and 2 and the Vista Point are not eligible for the National Register. In addition, Caltrans considered whether these individual components of the Crystal Springs Dam, including the dam, the outlet towers and vista point, might comprise a potential historic district, and concluded that there is no potential for a Crystal Springs Dam historic district.

Pursuant to Stipulation VIII.C.5 of the PA, Caltrans is requesting your concurrence with the following eligibility determinations:

- the Crystal Springs Pumping Station is **eligible** for the National Register under Criteria A and C
- Outlet Towers No. 1 and No. 2 are **not eligible** for the National Register under any applicable criteria
- the Vista Point is **not eligible** for the National Register under any applicable criteria.

Caltrans is also consulting the SHPO pursuant to Stipulation X.B.1 of the PA and requests your concurrence with our finding of No Adverse Effect for the proposed undertaking. In applying the Criteria of Adverse Effect, Caltrans finds that the proposed undertaking will have no adverse effect on either the Lower Crystal Springs Dam or the Crystal Springs Dam Pumping Station because removing and replacing the non-contributing Crystal Springs Dam Bridge will not adversely affect any of the characteristics that qualify the Dam or the Pumping Station as historic properties.

We look forward to receiving your written response within 60 days of your receipt of this submittal, in accordance with Stipulation VIII.C.5.a and X.B.1.b of the PA.

Caltrans, as assigned by FHWA, intends to make a *de minimis* finding for Section 4(f) use of a historic property based upon your concurrence in the Section 106 effect finding, pursuant to Section 6009(a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. Please note that if no response is received from the SHPO within 30 days of receipt of this submittal, Caltrans will still make a *de minimis* impact finding for purposes of Section 4(f).

If you need additional information, please do not hesitate to contact Jill Hupp at (916) 654-3567, or Andrew Hope, District 4 architectural historian at (916) 654-5611. Finally, thank you for your assistance with this undertaking.

Sincerely,

GREGORY P. KING
Chief
Cultural and Community Studies Office
Division of Environmental Analysis

c: JHupp – HQ; BDeunert – D4; AHope – D4
JH/jh

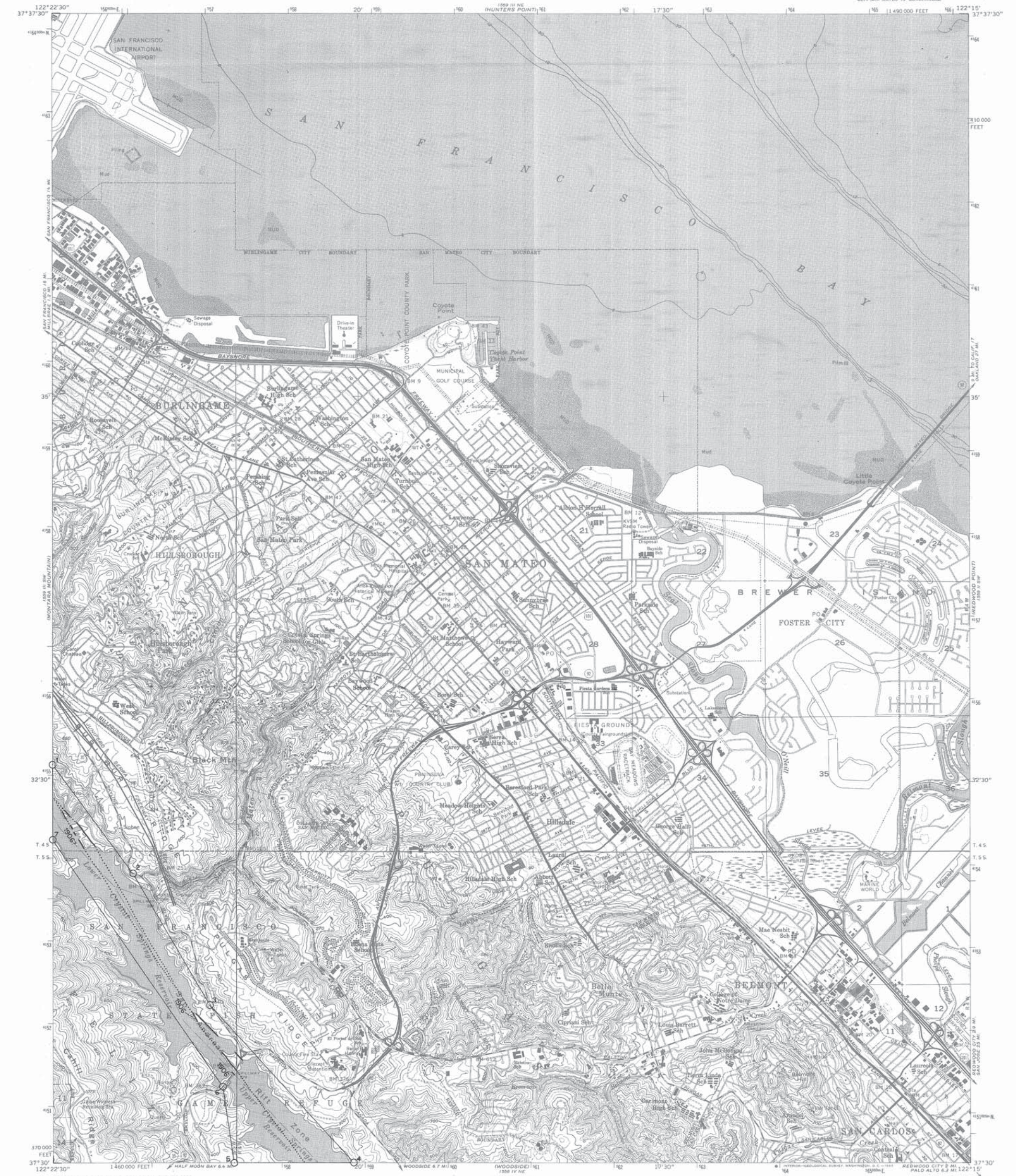
APPENDIX B

State of California Special Studies Zones Map for the San Mateo Quadrangle

CALIFORNIA DIVISION OF MINES AND GEOLOGY
JAMES E. SLOSSON, STATE GEOLOGIST

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF CONSERVATION

SAN MATEO QUADRANGLE
CALIFORNIA—SAN MATEO CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SE/4 SAN MATEO 15' QUADRANGLE



TOPOGRAPHIC BASE BY U.S. GEOLOGICAL SURVEY 1956
PHOTOREVISED 1968

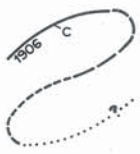
SCALE 1:24000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 5 0 1 KILOMETER

CONTOUR INTERVAL 25 FEET
DASHED LINES REPRESENT 5-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL
DEPTH CURVES IN FEET—DATUM IS MEAN LOWER LOW WATER
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE MEAN RANGE OF TIDE IS APPROXIMATELY 6 FEET

MAP EXPLANATION

Potentially Active Faults



Faults considered to have been active during Quaternary time; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by creep or possible creep.

Aerial photo lineaments (not field checked); based on youthful geomorphic and other features believed to be the results of Quaternary faulting.

Special Studies Zone Boundaries

These are delineated as straight-line segments that connect consecutively numbered turning points so as to define one or more special studies zone segments.

Seaward projection of zone boundary.

STATE OF CALIFORNIA
SPECIAL STUDIES ZONES

Delineated in compliance with Chapter 7.5, Division 2 of the California Public Resources Code

SAN MATEO QUADRANGLE

OFFICIAL MAP

Effective: July 1, 1974

James E. Slosson State Geologist

NOTICE
Effective January 1, 1994, the name "Special Studies Zones" has been changed to "**Earthquake Fault Zones**" and Chap. 7.5, Div. 2, of the Public Resources Code has been renamed the "**Alquist-Priolo Earthquake Fault Zoning Act.**"

IMPORTANT - PLEASE NOTE

1) *This map may not show all potentially active faults, either within the special studies zones or outside their boundaries.*

2) Faults shown are the basis for establishing the boundaries of the special studies zones.

3) The identification of these potentially active faults and the location of such fault traces are based on the best available data. Traces have been drawn as accurately as possible at this map scale, however, the quality of data used is highly varied. The faults shown have not been field checked during this map compilation.

4) Fault information on this map is not sufficient to serve as a substitute for information developed by the special studies that may be required under Chapter 7.5, Division 2, Section 2623 of the California Public Resources Code.

REFERENCES USED TO COMPILE FAULT DATA

San Mateo Quadrangle

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APPENDIX C

Greenhouse Gas Emissions Worksheet

Table C-1 Demolition Emissions

Equipment	Estimated Rating bhp	Multiplier	Hours per Month	Months	Total Equipment Hours	Total bhp-hr	NO_X 0.031 lbs/bhp-hr lbs	SO_X 0.00205 lbs/bhp-hr lbs	CO 0.00668 lbs/bhp-hr lbs	PM_{10} 0.0022 lbs/bhp-hr lbs	TOC 0.00247 lbs/bhp-hr lbs	CO_2 1.15 lbs/bhp-hr lbs	NO_X 0.031 lbs/bhp-hr lbs/day	SO_X 0.00205 lbs/bhp-hr lbs/day	CO 0.00668 lbs/bhp-hr lbs/day	PM_{10} 0.0022 lbs/bhp-hr lbs/day	TOC 0.00247 lbs/bhp-hr lbs/day	CO_2 1.15 lbs/bhp-hr lbs/day
14 cy end dump trucks	355	1.00	435	6	2610	926550	28723.05	1899.428	6189.354	2038.41	2288.579	1065532.5	4787.175	316.5713	1031.559	339.735	381.4298	177588.8
Flat Bed Trucks	190	1.00	261	6	1566	297540	9223.74	609.957	1987.567	654.588	734.9238	342171	1537.29	101.6595	331.2612	109.098	122.4873	57028.5
235 Excavator w demo point/crusher head/.5 cy bucket	250	1.00	348	6	2088	522000	16182	1070.1	3486.96	1148.4	1289.34	600300	2697	178.35	581.16	191.4	214.89	100050
Case backhoe/Loader w/breaker/spreader	80	1.00	348	6	2088	167040	5178.24	342.432	1115.827	367.488	412.5888	192096	863.04	57.072	185.9712	61.248	68.7648	32016
walk behind concrete saw cutting	60	1.00	348	6	2088	125280	3883.68	256.824	836.8704	275.616	309.4416	144072	647.28	42.804	139.4784	45.936	51.5736	24012
82 Case ton truck crane	170	1.00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
988 Cat loader	400	1.00	348	6	2088	835200	25891.2	1712.16	5579.136	1837.44	2062.944	960480	4315.2	285.36	929.856	306.24	343.824	160080
Gradall	177	1.00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walkbehind Compactor	6	1.00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gas Powered Rammer Compactor	6	1.00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AC Spreader Box	145	1.00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 ton Roller	75	1.00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1/2 ton Pickup	300	1.00	870	6	5220	1566000	48546	3210.3	10460.88	3445.2	3868.02	1800900	8091	535.05	1743.48	574.2	644.67	300150
1 ton Pickup	400	1.00	522	6	3132	1252800	38836.8	2568.24	8368.704	2756.16	3094.416	1440720	6472.8	428.04	1394.784	459.36	515.736	240120
Manitex Boom Truck	431	1.00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100 meter Concrete Pump	300	1.00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bidwell Spreader	310	1.00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 ton rt Crane	125	1.00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
compressors 160 cfm and air tool attachments	177	1.00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 kw generators & Small tools	24	1.00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small 2 cycle power tools	6	1.00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
							176464.7	11669.44	38025.3	12523.3	14060.25	6546271.5	29410.785	1944.907	6337.55	2087.217	2343.375	1091045
							lbs	lbs	lbs	lbs	lbs	lbs	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
							88.23236	5.83472	19.01265	6.261651	7.030126	3273.1358						
1 lb = .0005 short tons							tons	tons	tons	tons	tons	tons						
							261.1678				161.6929	3273.1358						
							tons CO2e				tons CO2e	tons CO2e						
							236.9274				146.6853	2969.3388						
							m tons				m tons	m tons						
							3352.952											

CO_2 = carbon dioxide
N_2O = nitrous oxide
TOC = total organic compounds
CH_4 = methane
NO_X emitted from high-temperature sources such as diesel combustion consists of less than 1 percent N_2O. TOC consists of methane, ethane, and several other compounds. This analysis assumes that all TOC emitted during Project construction would be methane.

Source: USEPA 2006; DOE 2003

Table C-2 Construction Emissions

Total Equipment Hours	Total BHP-hr	NO_X 0.031 lbs/bhp-hr lbs	SO_X 0.00205 lbs/bhp-hr lbs	CO 0.00668 lbs/bhp-hr lbs	PM_{10} 0.0022 lbs/bhp-hr lbs	TOC 0.00247 lbs/bhp-hr lbs	CO_2 1.15 lbs/bhp-hr lbs	NO_X 0.031 lbs/bhp-hr lbs/month	SO_X 0.00205 lbs/bhp-hr lbs/month	CO 0.00668 lbs/bhp-hr lbs/month	PM_{10} 0.0022 lbs/bhp-hr lbs/month	TOC 0.00247 lbs/bhp-hr lbs/month	CO_2 1.15 lbs/bhp-hr lbs/month
0	0	0	0	0	0	0	0	0	0	0	0	0	0
4698	892620	27671.22	1829.871	5962.702	1963.764	2204.771	1026513	1537.29	101.6595	331.2612	109.098	122.4873	57028.5
0	0	0	0	0	0	0	0	0	0	0	0	0	0
6264	501120	15534.72	1027.296	3347.482	1102.464	1237.766	576288	863.04	57.072	185.9712	61.248	68.7648	32016
0	0	0	0	0	0	0	0	0	0	0	0	0	0
4698	798660	24758.46	1637.253	5335.049	1757.052	1972.69	918459	1375.47	90.9585	296.3916	97.614	109.5939	51025.5
6264	2505600	77673.6	5136.48	16737.41	5512.32	6188.832	2881440	4315.2	285.36	929.856	306.24	343.824	160080
6264	1108728	34370.57	2272.892	7406.303	2439.202	2738.558	1275037.2	1909.476	126.2718	411.4613	135.5112	152.1421	70835.4
522	3132	97.092	6.4206	20.92176	6.8904	7.73604	3601.8	5.394	0.3567	1.16232	0.3828	0.42978	200.1
1044	6264	194.184	12.8412	41.84352	13.7808	15.47208	7203.6	10.788	0.7134	2.32464	0.7656	0.85956	400.2
72	10440	323.64	21.402	69.7392	22.968	25.7868	12006	17.98	1.189	3.8744	1.276	1.4326	667
162	12150	376.65	24.9075	81.162	26.73	30.0105	13972.5	20.925	1.38375	4.509	1.485	1.66725	776.25
15660	4698000	145638	9630.9	31382.64	10335.6	11604.06	5402700	8091	535.05	1743.48	574.2	644.67	300150
9396	3758400	116510.4	7704.72	25106.11	8268.48	9283.248	4322160	6472.8	428.04	1394.784	459.36	515.736	240120
6264	2699784	83693.3	5534.557	18034.56	5939.525	6668.466	3104751.6	4649.628	307.4754	1001.92	329.9736	370.4704	172486.2
864	259200	8035.2	531.36	1731.456	570.24	640.224	298080	446.4	29.52	96.192	31.68	35.568	16560
576	178560	5535.36	366.048	1192.781	392.832	441.0432	205344	307.52	20.336	66.2656	21.824	24.5024	11408
6264	783000	24273	1605.15	5230.44	1722.6	1934.01	900450	1348.5	89.175	290.58	95.7	107.445	50025
15660	2771820	85926.42	5682.231	18515.76	6098.004	6846.395	3187593	4773.69	315.6795	1028.653	338.778	380.3553	177088.5
4698	112752	3495.312	231.1416	753.1834	248.0544	278.4974	129664.8	194.184	12.8412	41.84352	13.7808	15.47208	7203.6
15660	93960	2912.76	192.618	627.6528	206.712	232.0812	108054	161.82	10.701	34.8696	11.484	12.8934	6003
		657019.9	43448.09	141577.2	46627.22	52349.65	24373318.5	36501.11	2413.783	7865.399	2590.401	2908.314	1354073.25
		lbs	lbs	lbs	lbs	lbs	lbs	lbs/month	lbs/month	lbs/month	lbs/month	lbs/month	lbs/month
		328.5099	21.72404	70.78859	23.31361	26.17482	12186.6593	1216.704	80.45943	262.18	86.3467	96.9438	45135.775
		tons	tons	tons	tons	tons	tons	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day

CO =
CO_2 = carbon dioxide
lbs/bhp-hr =
PM_{10} =
NO_X =
TOC = total organic compounds
SO_X =

APPENDIX D

1999 Biological Opinion from U.S. Fish and Wildlife

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
3310 El Camino Avenue, Suite 130
Sacramento, California 95821-6340

IN REPLY REFER TO:
1-1-98-F-145

March 15, 1999

Mr. Jeffrey A. Lindley
Division Administrator
(Attn.: Bill Wong)
Federal Highway Administration, California Division
980 Ninth Street, Suite 400
Sacramento, California 95814-2724

Subject: Endangered Species Formal Consultation on the Proposed Crystal Springs Dam Bridge Replacement, San Mateo County, California

Dear Mr. Lindley:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion on the proposed replacement of the Crystal Springs Dam Bridge, San Mateo County (County) and project effects on the federally threatened California red-legged frog (red-legged frog) (*Rana aurora draytonii*) and the federally endangered San Francisco garter snake (garter snake) (*Thamnophis sirtalis tetrataenia*). This opinion is provided in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act). Your July 29, 1998, request to initiate consultation was received in our office on July 30, 1998.

This biological opinion is based on information provided in: (1) the June 24, 1998, *Biological Assessment for the Crystal Springs Bridge Replacement Project* prepared by the County; (2) the October 1, 1998, telephone conversation between Ann Stillman from the County and Curt McCasland of my staff; (3) the October 22, 1998, visit to the project site attended by Mr. McCasland of my staff, the County's Public Works Department (PWD) staff, and Sam McGinnis, the biological consultant for the County; (4) the November 25, 1998, letter from Neil Cullen of the County's PWD to Mr. McCasland of my staff; and (5) the Notice of Determination, Negative Declaration, project description, Initial Study for the Crystal Springs Watershed Trails (Sawyer Camp Trail), and a map detailing the location of the trail sent by Ms. Stillman from the County on December 10, 1998.

The proposed bridge replacement project incorporates several modifications that may facilitate future actions by the County of San Mateo and the San Francisco Water District. These actions

include the future construction of the Sawyer Camp Trail south of the proposed project area and the raising of the Crystal Springs Dam. These actions are not included in this opinion, and any impacts to listed species associated with these actions are not authorized. The proposed development of the Sawyer Camp Trail and the raising of the dam may significantly impact several listed species and the Service suggests that the County and SFWD work with the Service to implement protection measures to ensure that impacts will not occur. If impacts cannot be avoided and a Federal agency is involved with the permitting, funding, or carrying out of this project, then initiation of formal consultation between that agency and the Service pursuant to section 7 of the Act is required. Such consultation would result in a biological opinion addressing anticipated effects of the project to listed and proposed species and may authorize a limited level of incidental take. If a Federal agency is not involved with the project, and federally listed species may be taken as part of the project, then an "incidental take" permit pursuant to section 10(a)(1)(B) of the Act should be obtained. The Service may issue such a permit upon completion by the permit applicant of a satisfactory conservation plan for the listed species that would be affected by the project.

CONSULTATION HISTORY

May 28, 1998. Staff from the Sacramento Fish and Wildlife Office (SFWO) met with Bill Wong of the Federal Highway Administration (FHWA), Neil Cullen, Ms. Stillman, and Nicholas Nguyen from the County's PWD, Sid Shadel from Caltrans, Dr. Sam McGinnis, a biological consultant for the County, and Suresh Patel and Darwin Helmuth from the City of San Francisco Water District (SFWD), regarding the proposed demolition and construction of the Crystal Springs Bridge. Issues related to the interrelatedness and interdependency of this project with the plans of SFWD to raise the level of the Crystal Springs Dam were discussed. Project affects and minimization measures were also discussed.

July 30, 1998. The FHWA requested initiation of formal section 7 consultation on the effects of the proposed Crystal Springs Dam Bridge construction on the red-legged frog.

October 1, 1998. Ms. Stillman from the County's PWD teleconferenced with Mr. McCasland of my staff about remaining issues associated with the proposed project. We believe, and informed Ms. Stillman, that this project would impact garter snakes and our biological opinion will include our analysis of impacts to this species. We also expressed the need for a development of a plan to create or restore suitable red-legged frog breeding habitat prior to the beginning of construction in order to minimize the consequences associated with any phase of this project. These consequences would include minimizing the loss of a complete year class of red-legged frog from the Crystal Springs watershed population or the loss of breeding habitat if the pond is no longer used after project completion. Furthermore, the County's proposal to supply monetary funds would not be acceptable as a contingency plan.

October 22, 1998. Mr. McCasland met with staff from the County and Mr. McGinnis, the County's biological consultant, at the project site and at the proposed rearing location on county land. At this time it was determined the best location for rearing the tadpoles was located at the base of the dam on the northern side of San Mateo Creek on SFWD property. The issue of habitat creation/restoration prior to implementation of the project and the location of the created/restored habitat were also discussed.

November 27, 1998. The Service received the County's November 25, 1998, letter which summarized a meeting between the County's Staff and the General Manager of the SFWD, Anson Moran, on November 13, 1998. The letter stated that SFWD would not allow the rearing of red-legged frog on SFWD lands nor would they allow any pond to be created within SFWD lands.

BIOLOGICAL OPINION

Description of Proposed Action

The County proposes to replace the existing Crystal Springs Dam Bridge, located southwest of the intersection of Crystal Springs Road and Highway 280 in San Mateo County, California. This bridge, which is owned by the County, is situated on top of Crystal Springs Dam, which is owned and operated by SFWD, and provides vehicular access to points north and south of the dam. The project area is located within the watershed containing the Lower and Upper Crystal Springs Reservoirs which are owned by SFWD.

In 1997, red-legged frog tadpoles were observed inhabiting the 0.06 acre pond located on top of the Crystal Springs Dam. The pond has a concrete bottom with accumulated sediment throughout the pond. The eastern edge of the pond receives sunlight and is vegetated, while the remaining unvegetated portions of the pond are shaded by the bridge. Red-legged frog eggs and tadpoles have been observed in both 1997 and 1998. No adults have been observed in or adjacent to the pond at any time. It appears that this pond is used exclusively as breeding habitat and that adults disperse immediately after breeding. This pond is also likely utilized by garter snakes as foraging habitat.

The proposed project will result in the replacement of the existing bridge on top of Crystal Springs Dam with a wider, steel-reinforced, concrete bridge. The new 51.5-foot wide, 605-foot long bridge will replace the existing 33-foot wide, 608-foot long bridge. The new bridge is designed to accommodate two 12-foot vehicle travel lanes, with 4-foot paved shoulders on either side, and a 15-foot multipurpose paved trail on the western side. The new bridge will be 18.5 feet wider and 3.5 feet higher and will overhang the dam more than the existing bridge. The adjacent road to the north and south of the new bridge (*i.e.*, Skyline Boulevard) will be slightly recontoured to meet the profile of the new bridge. This will be accomplished by raising the grade of Skyline Boulevard at both the north and south ends of the bridge for 300 feet on both ends.

A major portion of the new bridge is designed to slope to the east and away from the reservoir so the roadway runoff would flow down the east side of the dam and not into the reservoir. The drain from the roadway and path will carry all surface runoff to outfalls located on the east side of the bridge.

The new bridge design accommodates proposed modifications of the dam that are currently being considered by the SFWD. The bridge will completely span the spillway, and therefore, will not impede or otherwise interfere with these potential future modifications.

The construction of the proposed bridge will occur over two years in phases concurrent with the demolition and removal of the existing bridge. To allow for vehicle access onto the top of the dam, the existing north and south roadway grades will need to be slightly re-contoured. Once the existing bridge has been removed, construction of the new bridge will begin. Foundation support on top of the dam will require drilling and grouting of holes for steel bar anchorages; blasting will not be performed. Demolition of the existing bridge and construction of the new bridge will be expected to take approximately 21 months. Construction techniques designed to avoid activities that could potentially result in the deposition of sediments or construction materials in San Mateo Creek and/or the Lower Crystal Springs Reservoir will be implemented. These construction techniques will include:

- Falsework staging (system of timber trusses and columns built underneath the bridge to support plywood that will hold up the bridge during demolition).

- Tarps or nets to catch fine debris falling on either side of Crystal Springs Dam.
- Silt fences on adjacent hillsides to eliminate surface erosion and deposition into San Mateo Creek or Lower Crystal Springs Reservoir.

- A protective platform of steel beams and decking to protect the pond on top of Crystal Springs Dam.

To avoid and minimize project effects to red-legged frogs and garter snakes during demolition and construction, the following minimization measures are proposed:

- Remove frog-egg masses from the pond before demolition of the north end of the bridge.

- Erect a fence to exclude red-legged frogs (and garter snakes) from entering the pond during demolition or construction.

- Maintain frog eggs in artificial ponds during demolition and construction.

- Protect the pond from disturbance from construction.

- After construction is complete, restore the pond to its pre-construction condition.

- Move the tadpoles back into their original habitat before metamorphosis.

In order to implement the proposed minimization measures, the demolition of the existing bridge and construction of the new bridge have been divided into eleven stages. These minimization measures shall occur at certain times of the year in order to coincide with particular stages of red-legged frog development. The construction stages and schedule have been designed to:

- Avoid and minimize disturbance to the pond at the south end of the bridge.
- Minimize delays in the start and duration of construction.
- Minimize the time during which construction crews are idle.

Stage 1-Existing Bridge and Approaches: Bridge construction is proposed to begin in March 1999. Day and night visual surveys will be conducted in March 1999 to verify that all adult red-legged frogs have left the pond after spawning is completed.

Stage 2-Demolish Most of Existing Bridge: Once the absence of adult red-legged frogs is confirmed, a light, solid barrier wall will be constructed several feet beyond the north end of the pond basin. This wall will extend vertically from the top of the dam to the underside of the existing bridge and extend horizontally across the width of dam and project approximately three feet beyond the east face of the dam.

A second wall will also be constructed along the west edge of the pond (*i.e.*, the west face of the dam). This wall will also extend vertically from the top of the dam to the underside of the existing bridge. Tight seals will be made between all wall segments and the concrete of the dam and bridge which they join. These two walls will effectively seal off the entire pond from most of the bridge and dam. The south and east sides of the pond will remain open so that plants in the pond will receive light. In addition, red-legged frogs that metamorphose in the spring and summer of 1999 will be able to leave the pond as usual with the onset of fall rains.

In March through April of 1999, most of the existing Crystal Springs Bridge will be demolished. Demolition will occur from the north end of the bridge to the barrier wall.

Stage 3-Construct Most of New Bridge: During stage 3, the new bridge will be built from *the barrier wall to the north approach*. Stage 3 will last approximately 6 months and occur between May and November, 1999.

Stage 4-Relocate Frog Eggs in Habitat and Exclude San Francisco Garter Snakes from the Project Area: Stage 4 will last for approximately 1-2 months during January and February of 2000. Based on observations of red-legged frogs at the project site, it is assumed that adult

red-legged frogs are present in the pond on top of Crystal Springs Dam only during January and February to spawn. During this stage, adult frogs will have returned to the pond, spawned, and left again.

Surveys will be conducted in January and February, 2000, to determine when red-legged frog adults leave the pond. Once it is clear that adult frogs are finished spawning and are no longer in the pond, a 3-foot tall solid fence will be installed to exclude small vertebrates (*e.g.*, garter snakes). The fence will be installed on the south side (outside) of the existing chain link fence which borders the south end of the pond. The fence will also extend several feet beyond the east face of the dam to prevent passage around this end. At the point where the western end of the existing chain link fence joins the bridge, the fence will extend south along the hillside adjacent to the road for approximately 50 feet. The fence will be built of tightly fitting, overlapping 4 x 8 foot plywood panels buried 1 foot below ground level.

At the same time that the exclusion fence is being installed, all red-legged frog egg masses in the pond will be moved from the pond. Eggs will be carefully floated into water-filled buckets and transported to a temporary facility. This facility will consist of several 8-foot diameter pools (the number of pools will depend on the number of eggs laid that season). Prior to moving the frogs, each pool will have substrate and aquatic plants gathered from the pond added to mimic natural conditions.

Each pool will be protected from predators and tampering by a locked cover of one-inch-square welded wire mesh. A partial shade awning will be positioned over a portion of each pool so that the light hitting these pools will be similar to that which reached the sunlit portion of the actual pond habitat. These ponds will be monitored by trained biologists on a regular basis. Egg hatching and larval development will be closely monitored during stages 5 through 8. The aquatic vegetation in each pool may decline over time due to natural mortality or herbivory by tadpoles. If needed, additional aquatic vascular plants and algae could be added to each pool.

Stage 5-Install Protective Platform over Pond: In March of 2000, a protective cover will be installed over the pond to protect the pond from demolition and construction of the bridge above it. The concrete borders of the pond on top of Crystal Springs Dam will allow the structure to completely seal off the pond to prevent deposition of dust and debris during demolition and construction.

This protective platform will be constructed of steel beams placed horizontally between the west and east sides of the dam. The steel beams will be of variable lengths to fit into the stair-step of the interior walls of the dam. The beams will be covered by wood decking. Panels of styrofoam will also be used under the beams to float on the surface of the pond to further protect it from dust and small debris. This stage is expected to take approximately 2 weeks.

One side-effect of the sealing by this protective platform will be that the platform will eliminate light intercepting the pond. As a result, the aquatic vegetation within the pond will be lost. Plants salvaged during stage 4 will be used to replant the pond once the cover is removed.

Stage 6-Demolish Remaining Existing Bridge: Once the protective cover is in place, the remaining portion of the old bridge will be demolished. Stage 6 is expected to take approximately 2 weeks. The barrier walls on the north and west sides of the pond will be removed.

Stage 7-Construct Remaining New Bridge: From April to July, 2000, the remaining portion of the new bridge will be built.

Stage 8-Remove Protective Platform and Barrier Walls: Once stage 7 is complete, the protective platform over the pond will be removed.

Stage 9-Restore Habitat: Aquatic plants raised in pools at the larval-rearing facility will be positioned at various sites throughout the sunlit area of the pond. Beginning in August, 2000, red-legged frog larvae will be returned to the pond. It is expected that the frogs will metamorphose in early August and disperse into the upland habitat soon afterwards.

During this stage, the small vertebrate exclusion fence will be removed. After its removal, the newly-metamorphosed red-legged frogs will have access to the adjacent hillside once the fall rains provide a stimulus for movement. This stage is expected to take approximately 1 month.

Stage 10-Complete Bridge Approach Construction: Construction will be completed during this stage on the approaches to the new Crystal Springs Bridge. This stage is expected to take approximately 2 months.

Stage 11-Construction Complete: Construction should be completed by November, 2000, approximately 21 months after construction began. Construction will be completed approximately 1-2 months before adult red-legged frogs will be returning to the pond to spawn

Monitoring

To document the results of these minimization measures, the County proposes to monitor the pond for three years after construction is finished. Annual progress reports will be submitted to the Service during the implementation of these minimization measures. A final summary report at the end of the monitoring period will also be submitted to the Service.

Contingency Plan

The County also proposes the following measures:

1. The County will enter into an agreement with the Service to provide a contingency fund in case the proposed minimization measures fail to preserve the red-legged frog breeding habitat. Contingent to any particular failure, the fund will be spent on creating or enhancing red-legged frog breeding habitat, as approved by the Service. The amount will be limited to one percent of construction costs. Before activities of any significance are to commence, success criteria shall be developed in coordination with the Service.

2. Any delays or design changes in the construction project which may adversely impact the life cycle of the red-legged frog and minimization measures, described earlier, will be reviewed by the County and the Service. If agreed by both parties and in the interest of the red-legged frog, the construction project may be halted and resume the following year to facilitate the natural growth cycle of the larvae and/or frogs.

Status of the Species

San Francisco garter snake

The garter snake was listed as a Federal endangered species in March 1967 (32 **FR** 4001). The garter snake is an extremely colorful snake. It is identified by a burnt-orange head, yellow to a greenish-yellow dorsal stripe edged in black, and its red lateral stripe which may be continuous or broken with black blotches and edged in black. The belly color varies from greenish-blue to blue. Large adults can reach three feet in length.

The garter snakes' preferred habitat is a densely vegetated pond near an open hillside where it can sun itself, feed, and find cover in rodent burrows. They are extremely shy, difficult to locate and capture, and quick to flee to water or cover when disturbed. Adult snakes may seek cover in rodent burrows during summer months when ponds may dry. On the coast snakes hibernate during the winter, but further inland, if the weather is suitable, snakes may be active year round. Although highly vagile, adults spend considerable time after emergence in their hibernacula. They have been seen breeding at entrances to these burrows shortly after emergence from hibernation (Keel, pers. comm.) and may spend the majority of each day during the active season in the same burrows. Garter snakes breed in the spring or late fall and bear live young from May through October, with an average litter size of 12-18 (Stebbins 1985).

Although primarily a diurnal species, captive snakes housed in an outside enclosure were observed foraging at night on warm evenings. Adult snakes feed primarily on red-legged frogs, and may also feed on juvenile bullfrogs (*Rana catesbeiana*). In laboratory studies, Larsen (1994) fed adult garter snakes 2 year old bullfrog tadpoles and found that only the largest adults could eat and digest the tadpoles; smaller adults regurgitated partially digested tadpoles, apparently unable to fully digest them. Larsen (1994) also observed that when these smaller adult snakes were fed bullfrogs and red-legged frogs of comparable size, they were unable to hold and eat the

bullfrogs although they had no trouble with the red-legged frogs. Newborn and juvenile garter snakes depend heavily upon Pacific treefrogs (*Hyla regilla*) as prey (Larsen 1994), and young snakes may not survive if they are unavailable.

Many of the threats that led to the listing of the garter snake in 1967 continued to impact the species in 1985 when the Recovery Plan was written. These included loss of habitat from agricultural, commercial and urban development and collection by "reptile fanciers and breeders" (USFWS 1985).

The historical threats to the species remain, but there are now additional threats to the species, such as the documented decline of the red-legged frog (an essential prey species) and the introduction of bullfrogs into garter snake habitat. Bullfrogs are capable of preying on both garter snakes and red-legged frogs. Extirpation of red-legged frogs in garter snake habitat is likely to cause localized extinction of garter snakes.

California red-legged frog

The red-legged frog was federally listed as threatened on May 23, 1996, (61 **FR** 25813) effective June 24, 1996. This species is the largest native frog in the western United States (Wright and Wright 1949), ranging from 4 to 13 centimeters (1.5 to 5.1 inches) in length (Stebbins 1985). The abdomen and hind legs of adults are largely red; the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 1985), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 14 to 80 millimeters (0.6 to 3.1 inches) in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

Red-legged frogs have paired vocal sacs and vocalize in air (Hayes and Krempels 1986). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on the surface of the water (Hayes and Miyamoto 1984). Red-legged frogs breed from November through March with earlier breeding records occurring in southern localities (Storer 1925). Individuals occurring in coastal drainages are active year-round (Jennings *et al.* 1992), whereas those found in interior sites are normally less active during the cold season.

Adult red-legged frogs prefer dense, shrubby or emergent riparian vegetation closely associated with deep (>0.7 meter), still, or slow-moving water (Hayes and Jennings 1988). However, red-legged frogs also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. The largest densities of red-legged frogs currently are associated with deep pools with dense stands of overhanging willows and an intermixed fringe of cattails (*Typha latifolia*) (Jennings 1988). Red-legged frogs disperse upstream and downstream of their breeding habitat to forage and seek sheltering habitat. Sheltering habitat for red-legged frogs includes potentially all aquatic, riparian, and upland areas within the range of the species and any landscape features that provide cover, such as existing animal burrows, boulders or

rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay ricks may also be used. Incised stream channels with portions narrower than 18 inches and depths greater than 18 inches may also provide important summer sheltering habitat. Accessability to sheltering habitat is essential for the survival of red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival. During winter rain events, juvenile and adult red-legged frogs are known to disperse up to 1-2 km (Rathbun and Holland, unpublished data, cited in Rathbun *et al.* 1991).

Egg masses contain about 2,000 to 5,000 moderate sized (2.0 to 2.8 mm [0.08 to 0.11 inches] in diameter), dark reddish brown eggs and are typically attached to vertical emergent vegetation, such as bulrushes (*Scirpus* spp.) or cattails (Jennings *et al.* 1992). Red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Eggs hatch in 6 to 14 days (Jennings 1988). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992); eggs exposed to salinity levels greater than 4.5 parts per thousand result in 100% mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3.5 to 7 months after hatching (Storer 1925, Wright and Wright 1949, Jennings and Hayes 1990). Of the various life stages, larvae probably experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). Sexual maturity normally is reached at 3 to 4 years of age (Storer 1925, Jennings and Hayes 1985). Red-legged frogs may live 8 to 10 years (Jennings *et al.* 1992).

The diet of red-legged frogs is highly variable. Hayes and Tennant (1985) found invertebrates to be the most common food items. Vertebrates, such as Pacific tree frogs (*Hyla regilla*) and California mice (*Peromyscus californicus*), represented over half the prey mass eaten by larger frogs (Hayes and Tennant 1985). Hayes and Tennant (1985) found juvenile frogs to be active diurnally and nocturnally, whereas adult frogs were largely nocturnal. Feeding activity probably occurs along the shoreline and on the surface of the water (Hayes and Tennant 1985). Larvae likely eat algae (Jennings *et al.* 1992).

Several researchers in central California have noted the decline and eventual disappearance of red-legged frog populations once bullfrogs became established at the same site (L. Hunt, in litt. 1993, S. Barry, in litt. 1992, S. Sweet, in litt. 1993). This has been attributed to both predation and competition. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs, and suggested that bullfrogs could prey on subadult red-legged frogs as well. In addition to predation, bullfrogs may have a competitive advantage over red-legged frogs: bullfrogs are larger, possess more generalized food habits (Bury and Whelan 1984), possess an extended breeding season (Storer 1933) where an individual female can produce as many as 20,000 eggs during a breeding season (Emlen 1977), and larvae are unpalatable to predatory fish (Kruse and Francis 1977). In addition to competition, bullfrogs also interfere with red-legged frog reproduction. Both California and northern red-legged frogs have been observed in amplexus

with (mounted on) both male and female bullfrogs (Jennings and Hayes 1990, Twedt 1993, M. Jennings, in litt.1993, R. Stebbins in litt. 1993). Thus, bullfrogs are able to prey upon and out-compete red-legged frogs, especially in sub-optimal habitat.

Environmental Baseline

The environmental baseline used in this analysis includes past and ongoing impacts of all Federal, State, Tribal, and private actions and other human activities in the vicinity of the project that have impacted, or are impacting the listed species.

Red-legged frogs have been extirpated or nearly extirpated from over 70 percent of their former range. Historically, this species was found throughout the Central Valley and Sierra Nevada foothills. As of 1996, red-legged frogs were known to occur in approximately 240 streams or drainages from 23 counties, primarily in central coastal California. Monterey, San Luis Obispo, and Santa Barbara counties support the largest extent of currently occupied habitat. The most secure aggregations of red-legged frogs are found in aquatic sites that support substantial riparian and aquatic vegetation and lack non-native predators. Several researchers in Central California have noted the decline and eventual local disappearance of red-legged frogs in systems supporting bullfrogs (Jennings and Hayes 1990), red swamp crayfish (*Procambarus clarkii*), signal crayfish (*Pacifastacus leniusculu*), and several species of warm water fish including sunfish (*Lepomis* spp.), goldfish (*Carassius auratus*), common carp (*Cyprinus carpio*), and mosquitofish (*Gambusia affinis*) (L. Hunt, in litt. 1993, S. Barry, in litt. 1992, S. Sweet, in litt. 1993). Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the red-legged frog throughout its range.

The administrative draft recovery plan for red-legged frogs identifies eight Recovery Units. Within each Recovery Unit, Core Areas have been delineated and represent areas of moderate to high red-legged frog densities and are identified as areas where recovery actions will be focused. This project is located within a Core Area of the proposed Central Coast Recovery Unit, which includes the western portions of San Mateo and Santa Clara Counties, and portions of Santa Cruz, Monterey, and San Luis Obispo Counties. This Recovery Unit is at the core of the remaining distribution of red-legged frogs.

Within this Recovery Unit, the project area lies in an area identified as a Core Area that extends from Crystal Springs Reservoir west to Half Moon Bay and Pacifica. Within this Core Area, red-legged frogs historically bred in several ponds and drainages adjacent to the proposed project area including San Mateo Creek and numerous sag ponds which were historically common within this area. This pond is one of only two known breeding populations of red-legged frogs remaining in the Crystal Springs area. Factors associated with the paucity of red-legged frog breeding habitat within the area include predation by fish and bullfrogs, and the drying of habitat before metamorphosis can occur. The project site serves as a source population for the Reservoir sub-population. Portions of land surrounding the project area are undeveloped, and support primarily mixed evergreen forest.

In the summer of 1997, Mr. Sam McGinnis observed a large population of red-legged frog tadpoles in the shallow 0.06 acre concrete pool on top of the south end of Crystal Springs Dam. This pool receives surface runoff water during the winter rain season and then remains relatively full throughout the summer and fall moths. During 1998, several surveys were conducted at the pond and no adults were observed, however 6 egg masses were observed during the breeding season. This suggests that red-legged frogs use this pond to breed but do not utilize the pond as non-breeding habitat. The likely explanation is the lack of shoreline vegetation that could be used as cover within the pond. It is likely that remaining frogs could be easily preyed upon by an assortment of species such as racoons and skunks.

The Recovery Plan for the garter snake (Service 1985) identified six significant populations. These were West of Bayshore (W-O-B), Laguna Salada (Pacifica), Pescadero Marsh Natural Preserve (Pescadero), Año Nuevo State Reserve (Año Nuevo), an isolated population north of Half Moon Bay (Half Moon Bay), and the San Francisco State Fish and Game Refuge (Refuge) which includes the project area. Of the six populations existing in 1985, the Pacifica population was heavily impacted in 1989 and is no longer considered significant, four have declined drastically (W-O-B, Refuge, Pescadero and Año Nuevo). The status of the Half Moon Bay population is unknown, however small developments have occurred and ongoing threats such as drawing down agricultural ponds to irrigate croplands, over grazing, the conversion of coastal scrub habitat to agricultural land continue to occur. Furthermore, populations of exotic species such as bullfrogs and exotic fish have been established within the area, likely resulting in the chronic predation of juvenile garter snakes as well as the reduction in snake prey items such as red-legged frogs.

Of the declining populations, the Año Nuevo population appears to have the slowest rate of decline. Recent recovery actions at Año Nuevo may be further slowing the decline of that population. However, current land management practices outside of State park lands are impacting the Año Nuevo population. It is unknown whether or not recovery efforts made by the California State Parks will be sufficient to change the trend in that population.

The most significant decline in population numbers of garter snakes (apart from Pacifica) is the decline of the W-O-B population. Data on this population has shown a dramatic downward trend in numbers over the past several years. Larsen (1994) trapped the population between 1990 and 1992, and detected a possible population decline greater than 70 percent from the 1983 to 1985 population census completed by Wharton (1989). In approximately eight site visits made by the Service from November 1994 to present, one dead garter snake (apparently run over by a vehicle), one paralyzed garter snake, and two apparently healthy garter snakes have been found.

The Refuge population is found on SFWD's lands in the area encompassing the Upper and Lower Crystal Springs, which includes the project area, and San Andreas Reservoirs. This population is highly dispersed throughout the reservoir and is heavily impacted from predation by introduced fishes, reservoir fluctuations and dewatering, bullfrogs, and loss of seasonal wetlands.

Effects of the Proposed Action

Effects to the red-legged frog include direct effects to individual frogs and habitat that may occur during bridge demolition and construction, indirect effects to habitat within the project area once the project is completed, and cumulative effects to the local red-legged frog population resulting from the project once it is in place. Effects to garter snakes include indirect effects associated with the loss of foraging habitat and a decrease in prey availability.

Direct effects of the project include the potential for harassment, injury and/or mortality of eggs, tadpoles, and juveniles during bridge demolition and construction. This includes the risk of incidental take from pre-construction surveys, relocation of egg masses, rearing of tadpoles, and relocating and releasing individuals, and disturbance to habitat from the construction of the new bridge. The project will result in the temporary loss of red-legged frog breeding habitat and garter snake foraging habitat, specifically 0.06 acre of breeding and foraging habitat will be temporarily lost.

The potential for adverse effects to red-legged frogs are largely restricted to the bridge demolition and construction activities and the rearing of eggs and tadpoles in temporary breeding habitat. Garter snakes forage extensively on red-legged frogs and will temporarily lose foraging habitat which may affect their overall health. Adverse indirect effects include the possible permanent loss of red-legged frog breeding habitat and garter snake foraging habitat due to the increase in bridge dimensions, the new bridge will be 18.5 feet wider. This may result in an overall change in the amount of sunlight the pond receives which may affect the temperature and/or chemical characteristics of the pond, as well as aquatic vegetation inhabiting the pond. The potential loss of red-legged frog breeding habitat would be an extremely significant impact on garter snakes within the Crystal Springs watershed. The loss of one of only two known breeding populations would significantly reduce the availability of prey for this species and would likely result in a significant decline in this garter snake population.

The noise and ground vibrations expected from the use of heavy equipment during demolition activities may harass red-legged frog tadpoles and garter snakes attempting to forage in the project area.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Several of the impacts described in the environmental baseline section have adverse cumulative effects on both red-legged frogs and garter snakes within the project vicinity. The raising of Crystal Springs Reservoir will significantly impact the remaining known breeding population of red-legged frogs within the watershed. This will result from the increase in water level which

will further subject the remaining breeding habitat to periods of flooding and drying related to water use by SFWD. There will be no remaining breeding populations within the watershed, which would significantly impact both the populations of red-legged frogs and garter snakes. The complete loss of all known breeding populations of red-legged frogs would result in the loss of this population of garter snakes from the Crystal Springs watershed. In addition, to the loss of prey availability, garter snakes may also be further subjected to impacts form predation by introduced fishes, reservoir fluctuations and dewaterings, bullfrogs, and loss of seasonal wetlands.

Conclusion

After reviewing the current status of the species, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Crystal Springs Bridge replacement, including the avoidance and minimization measures proposed, is not likely to jeopardize the continued existence of the red-legged frog or the garter snake. No statutory critical habitat has been designated for this species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service expects that incidental take of red-legged frogs and garter snakes will be difficult to detect or quantify for the following reasons: the aquatic nature of the organisms and the relatively small body size of the red-legged frog eggs and tadpoles make the finding of a dead specimens unlikely. Due to the difficulty in quantifying the number of red-legged frogs that will be taken as a result of the proposed action, the Service is quantifying take incidental to the project as the number of acres of habitat that will become unsuitable for the species as a result of the action. Therefore, the Service estimates that 0.06 acres of red-legged frog and garter snake habitat will become temporarily unsuitable as a result of the proposed action. Mortality or injury of garter snakes associated with the completion of this project is not authorized. The Service has developed the following incidental take statement based on the premise that the reasonable and prudent measures will be implemented. Upon implementation of the following reasonable and prudent measure, incidental take associated with the Crystal Springs Bridge replacement on 0.06 acre of habitat will become exempt from the prohibitions described under section 9 of the Act for direct impacts, and incidental take associated with the Crystal Springs Bridge Replacement on 0.06 acre of habitat will be exempt from the prohibitions described under section 9 of the Act for indirect impacts as a result of the management activities described.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the red-legged frog or the garter snake or destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize the impacts of take on the listed species:

1. Minimize harm to the red-legged frog and the garter snake resulting from temporary habitat modification or permanent loss.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the FHWA must comply with the following term and condition, which implement the reasonable and prudent measure described above. This term and condition is nondiscretionary.

1. To minimize the impacts of habitat modification or loss to the red-legged frog or garter snake, the FHWA shall ensure that San Mateo County complies with the following:

a. Red-legged frogs shall be reared within SFWD land immediately downstream of the Crystal Springs dam on the north side of San Mateo Creek in a location approved by the Service.

b. Prior to the implementation of Stage 4 (Relocation of red-legged frog eggs and exclusion of garter snakes) activities, the County shall create or enhance a minimum of 0.30 acre of potential red-legged frog breeding habitat and garter snake foraging habitat within the immediate Crystal Springs Watershed. The location of the pond(s) will be approved by the Service prior to their construction/enhancement and will be managed as red-legged frog breeding habitat and garter snake foraging habitat.

I. Prior to the implementation of Stage 4 activities, a Service-approved conservation easement shall be placed on the newly created/restored pond(s) for the protection of red-legged frogs and garter snakes and their habitat in perpetuity from further development. The easement shall include, but not be limited to, provisions and responsibilities of the County and SFWD for the protection of the pond(s) including any future transfers of the easement or fee interest that may be anticipated. The Service shall receive a true copy of the recorded conservation easement within 30 days of its recordation. The easement shall be held by a third party approved by the Service. The easement shall include a list of prohibited activities that are inconsistent with the maintenance of the preserve(s) for the listed species, including, but not limited to:

(1) leveling, grading, landscaping, cultivation, or any other alterations of existing topography for any purposes, including the exploration for, or development of, mineral resources;

(2) placement of any new structures on the preserve, including buildings and billboards;

(3) discharge, dumping, burning, or storing of rubbish, garbage, grass clippings, dredge material, household chemicals, or any other wastes or fill materials within the preserve(s);

(4) building of any new roads or trails within the preserve(s);

(5) operating a motor vehicle within the preserve(s);

(6) killing, removal, alteration, or replacement of any existing native vegetation;

(7) activities that may alter with the hydrology of the preserve(s) and the associated watersheds, including but not limited to: excessive pumping of groundwater, manipulation or blockage of natural drainages, inappropriate water application or placement of storm water drains, etc.;

(8) incompatible fire protection activities;

(9) livestock grazing, except as described in a Service-approved management plan;

(10) use of pesticides, herbicides, or rodenticides on the preserve or within the watershed that can contaminate the preserve; and

(11) introduction of any exotic species, including aquatic species;

ii. The County shall establish an adequate endowment fund for monitoring and perpetual management and maintenance of the pond(s). The principal in the endowment must generate sufficient revenue to cover the costs of alien species removal, maintenance of fencing, monitoring of red-legged frogs, and remediation of indirect effects in perpetuity. This endowment shall be made to a Service-approved entity prior to the implementation of stage 4 activities. Specific actions covered under the endowment shall be addressed in the Mitigation and Management Plan (further described below). A third party selected by the applicant and approved by the Service, the County, and California Department of Fish and Game (CDFG) shall work with the applicant to determine what amount of money is necessary for an endowment fund to adequately finance the monitoring and perpetual management and maintenance of the preserve and mitigation area(s).

iii. Prior to implementing Stage 4 activities, the applicant shall provide the Service and the FHWA documentation that: (1) funds for the perpetual management of the pond(s) have been transferred to the appropriate third-party approved by the Service and the FHWA; (2) the third party has accepted the funds and considers them adequate; and (3) that these funds have been deposited in an account (*i.e.* endowment) that will provide adequate financing for the monitoring and perpetual management and maintenance of the preserve and mitigation area.

iv. A Mitigation and Management Plan for the pond shall be completed. A draft of the Mitigation and Management Plan shall be submitted to the Service for review and approval prior to the initiation of Stage 4. The

final Mitigation and Management Plan shall be submitted to the Service by March, 2000. This Mitigation and Management Plan shall include, but not be limited to:

(1) discussions of the management and maintenance in perpetuity of the wetland habitat for the red-legged frogs and garter snakes, including documentation that adequate funds exist for the monitoring and perpetual management and maintenance of the pond;

(2) discussions of runoff control and maintenance of hydrology of the aquatic habitat;

(3) provisions for a monitoring program to be set up and implemented with a monitoring report every year that addresses the ecological functions of the preserve;

(4) Reasonable access to the preserve shall be allowed with a 24-hour notice by the Service, FHWA, or CDFG, and/or other appropriate agencies.

(5) Dewatering devices shall be installed that are able to remove all standing water from the pond(s) for the control of bullfrogs.

c. The County shall submit monthly progress reports regarding the rearing of eggs and larval red-legged frogs. These reports shall be received by the Service no later than the second Monday of each month project activities are occurring. These reports should provide details relating to the amount of mortality associated with each egg mass,

The reasonable and prudent measure, with its implementing term and condition, is designed to minimize the impact of incidental take that might otherwise result from the proposed action. With implementation of this measure, the Service believes that no more than 0.06 acre of red-legged frog and garter snake habitat will be temporally lost through project construction activities.

If during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring review of the reasonable and prudent measures provided. The Corps must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Reporting Requirements

The Service must be notified within 24 hours of the finding of any injured or dead red-legged frogs or garter snakes, or any unanticipated damage to the species habitat associated with project construction, minimization measures, or operation. Notification must include the date, time, and precise location of the specimen/incident, and any other pertinent information. The Service contact person is the Chief, Endangered Species Division in the SFWO, at (916) 979-2725. Any dead or injured specimens will be reposited with the Service's Division of Law Enforcement, 3310 El Camino Avenue, Suite 140, Sacramento, California 95821-6340, telephone (916) 979-2987.

Provide copies of annual reports on the status and success of the minimization actions to the Chief, Endangered Species Division, in the Service's SFWO.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to implement recovery actions, to help implement recovery plans, to develop information, or otherwise further the purposes of the Act.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations. We have the following recommendations:

1. The FHWA shall host a series of meetings where Caltrans, the County, the SFWD, the CDFG, and the Service are invited to come and discuss issues related to ongoing impacts of numerous federally listed species found within the Crystal Springs area.

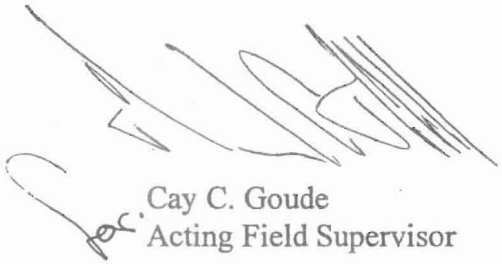
REINITIATION–CLOSING STATEMENT

This concludes formal consultation on the actions outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In

instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this opinion, please contact Curtis McCasland or Ken Sanchez at (916) 979-2752.

Sincerely,



for Cay C. Goude
Acting Field Supervisor

cc: PARD (ES), Portland, OR
CDFG, Yountville, CA (Carl Wilcox), Yountville, CA
CalTrans (Michael Lin), Oakland, CA
San Mateo County (Ann Stillman), Redwood City, CA
Sam McGinnis, Manteca, CA

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Personal Communication:

Keel, Paul. Año Nuevo State Reserve, Pescadero, California, 94060.

APPENDIX E

2009 Amendment to the 1999 Biological Opinion from U.S. Fish and Wildlife

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:
81420-2008-F-0417

JUN - 8 2009

Boris Deunert, Ph.D.
Senior Environmental Planner
California Department of Transportation
Office of Local Assistance
111 Grand Avenue
P.O. Box 23660
Oakland, California 94623-0660

Subject: Amendment to the Biological Opinion on the Effects of the Proposed Crystal Springs Dam Bridge Replacement, San Mateo County (Service File No. 1-1-98-F-145)

Dear Mr. Deunert:

This document amends the U. S. Fish and Wildlife Service's (Service) March 15, 1999, *Endangered Species Formal Consultation on the Proposed Crystal Springs Dam Bridge Replacement, San Mateo County, California* (1999 BO). At issue are the effects of this project on the federally threatened California red-legged frog (*Rana draytonii*) and the federally endangered San Francisco garter snake (*Thamnophis sirtalis tetrataenia*). The California Department of Transportation's (Caltrans) request for the amendment was received in our office on November 28, 2007. This amendment is provided in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act).

This amendment to the biological opinion is based on information and additional consultation enumerated below:

(1) *October 2005.* The San Francisco Public Utilities Commission (SFPUC) stated they would now allow the County to mitigate for the impacts of the Bridge Replacement Project on SFPUC property on the west side of Highway 280.

(2) *November 2005.* Mr. Ryan Olah of my staff met with SFPUC and their consultant, Karen Swaim, at the pool on top of the dam. Removal of the pond from the dam was discussed. The Service agreed that permanent removal of the California red-legged frog (CRLF) pond on top of Crystal Springs Dam was acceptable and desirable understanding the operation of the facilities that utilize the area. The Service agreed that the CRLF pond is not a very important area with respect to the San Francisco garter snake (SFGS) because of the isolation and difficulty of access to the site. The Service agreed that San Mateo County's Biological Assessment could be updated

with the submittal of an addendum. The addendum would include the new biological information collected by SFPUC Consultant Karen Swaim.

(3) *September 2006.* Karen Swaim met with Ryan Olah at the Sacramento Field Office and teleconferenced with Dave Johnston of the California Department of Fish and Game (CDFG) to discuss details of the new CRLF protection plan and mitigation. The Service indicated that the San Mateo County (SMC) impacts to the pond could be considered temporary impacts and that the pond and frog population there could be protected in place during bridge replacement. The Service and CDFG agreed to modifications in the 1999 BO as follows: Protecting the population in place while relocating only half (½) of the CRLF egg masses instead of all of them, to a natural habitat versus rearing the eggs in an artificial pond. They also agreed that designing the protection platform to allow light into the pond during construction would be required since CRLF tadpoles and or metamorphosed individuals may still be present in the pond during the demolition. USFWS and CDFG agreed that mitigation for impacts to the pond during construction could be mitigated for through take avoidance measures in the 1999 BO and the modifications described above and enhancement of habitat in the watershed that would be beneficial to CRLF and SFGS. The amount to be enhanced would be 0.3 acres.

(4) *March 2007.* Karen Swaim submitted a plan to Ryan Olah and David Johnston in a March 27, 2007, electronic mail, to mitigate for the temporary impacts during bridge replacement. The mitigation will consist of predator control (bullfrog and non-native turtle depredation) at one of the largest and closest known CRLF breeding locations to the Crystal Springs Dam pool. This site, located at the north end of Lower Crystal Springs Reservoir, consists of a large seasonal basin called Tracy Lake and the contiguous adjacent marsh. The area totals approximately 25 acres and is an important CRLF reproduction area and supports a resident population of San Francisco garter snakes. The location is distinct or isolated enough that predator control can be beneficial to the co-occurring CRLF and SFGS population. Predator control will take the form of bullfrog egg mass removal, seining and selective removal off bullfrog larvae, and direct removal of adult and juvenile bullfrog and turtles through aquatic trapping and gigging. The program will begin concurrently with the bridge replacement project start up. This program will benefit both CRLF and SFGS and includes an area significantly larger than 0.30 acres. Removal of bullfrog and other non-native predators in this area is expected to provide benefit to both CRLF and SFGS populations that are known to occur in Tracy Lake and the Upper Marsh of LCSR. The predator control program will continue for two years. Bullfrogs breed in the LCSR upper marsh and juvenile and adult bullfrog occupy Tracy Lake. Other introduced predators present in the area include red-eared sliders painted turtles and soft shelled turtles. Swaim Biological found a painted turtle in the process of eating a treefrog in Tracy Lake on February 15, 2007. We would use the following techniques and schedule to control predators:

1. Removal of bullfrog egg masses (Late March - June)
2. Removal of larval, adult and metamorphosed bullfrog and non-native turtles (late March-October) via gigging, hand capture, seining, and aquatic trapping.

(5) David Johnston and Ryan Olah provided written (email) approval of this plan on March 28, 2007 as acceptable mitigation for the impacts, and;

(6) *Updated Status of Occurrence of the CRLF in the Project Vicinity*

When the 1999 BO was issued, it indicated that the top of dam pool was one of only two breeding "populations" of CRLF in the Crystal Springs area. McGinnis (1998) surveyed many sites around the reservoir, but found breeding only at the top of the dam pool and in the Tracy Lake/upper marsh area of LCSR. McGinnis (1998) reported two individual adult CRLF specimens were found during protocol level surveys at CalTrans Sed Basins 4 and 5. In addition, a single adult, on the southwest shore of Lower Crystal Springs Reservoir (LCSR) near Highway 92, was observed by a CalTrans biologist (McGinnis 1998). Since that time, several other breeding locations or likely breeding populations (Kossack 2003) (Swaim Biological 2005 and 2006) have been documented. Locations were considered as "breeding pond" only if egg masses or larval CRLF were found during surveys. A breeding pond location was considered distinct if it was a separate water body or a distinct marsh area along the margins of the reservoirs separated by non-marsh habitat. The specific locations, on LCSR near the dam pool in a counter clockwise path around LCSR are as follows:

1. Marsh LN-4 Upper Marsh of LCSR (east side and north end)
2. Tracy Lake
3. Marsh LN-5 -west side of LCSR between Tracy Lake and inlet of San Mateo Creek
4. Marsh LN 14- west side of LCSR between Tracy Lake and inlet of San Mateo Creek
5. Marsh L16- at inlet of San Mateo Creek into LCSR
6. Marsh L20-(inlet marsh below Skyline Quarry)
7. CalTrans Sed Basin 5
8. Below Crystal Springs Dam

Other areas in the watershed support CRLF breeding or are suspected to support breeding CRLF populations or sub-populations. These include survey sites where several recently metamorphosed CRLF or adult CRLF have been observed and the habitat is physically suitable for breeding (e.g. Crystal Springs Golf Course pond).

The following changes are made to the March 15, 1999 biological opinion.

1. **Change the third paragraph under the Description of the Proposed Action on page 4 from:**

> The construction of the proposed bridge will occur over two years in phases concurrent with the demolition and removal of the existing bridge. To allow for vehicle access onto the top of the dam, the existing north and south roadway grades will need to be slightly re-contoured. Once the existing bridge has been removed, construction of the new bridge will begin. Foundation support on top of the dam will require drilling and grouting of holes for steel bar anchorages; blasting will not be performed. Demolition of the existing bridge and construction of the new bridge will be expected to take approximately 21 months.

To:

> The existing bridge will be demolished within a one year period. After demolition and

removal of the existing bridge, it is anticipated that the SFPUC will begin work on the Lower Crystal Springs Dam Improvement Project, which is separate and distinct from this bridge replacement project. As part of that project the SFPUC will remove and fully compensate for the loss of the red-legged frog pond on top of the dam. Once the SFPUC has completed their project, the County will construct the new bridge.

2. Change pages 4-6 under the Description of the Proposed Action from:

To avoid and minimize project effects to red-legged frogs and garter snakes during demolition and construction, the following minimization measures are proposed:

- Remove frog-egg masses from the pond before demolition of the north end of the bridge.
- Erect a fence to exclude red-legged frogs (and garter snakes) from entering the pond during demolition or construction.
- Maintain frog eggs in artificial ponds during demolition and construction.
- Protect the pond from disturbance from construction.
- After construction is complete, restore the pond to its pre-construction condition.
- Move the tadpoles back into their original habitat before metamorphosis.

In order to implement the proposed minimization measures, the demolition of the existing bridge and construction of the new bridge have been divided into eleven stages. These minimization measures shall occur at certain times of the year in order to coincide with particular stages of red-legged frog development. The construction stages and schedule have been designed to:

- Avoid and minimize disturbance to the pond at the south end of the bridge.
- Minimize delays in the start and duration of construction.
- Minimize the time during which construction crews are idle.

Stage 1-Existing Bridge and Approaches: Bridge construction is proposed to begin in March 1999. Day and night visual surveys will be conducted in March 1999 to verify that all adult
red-legged frogs have left the pond after spawning is completed.

Stage 2-Demolish Most of Existing Bridge: Once the absence of adult red-legged frogs is confirmed, a light, solid barrier wall will be constructed several feet beyond the north end of the pond basin. This wall will extend vertically from the top of the dam to the underside of the existing bridge and extend horizontally across the width of dam and project approximately three feet beyond the east face of the dam.

A second wall will also be constructed along the west edge of the pond (*i.e.*, the west face of the dam). This wall will also extend vertically from the top of the dam to the underside of the existing bridge. Tight seals will be made between all wall segments and the concrete of the dam and bridge which they join. These two walls will effectively seal off the entire pond from most of the bridge and dam. The south and east sides of the pond will remain open so that plants in the pond will receive light. In addition, red-legged frogs that metamorphose in the spring and summer of 1999 will be able to leave the pond as usual with the onset of fall rains.

In March through April of 1999, most of the existing Crystal Springs Bridge will be demolished. Demolition will occur from the north end of the bridge to the barrier wall.

Stage 3-Construct Most of New Bridge: During stage 3, the new bridge will be built from *the barrier wall to the north approach.* Stage 3 will last approximately 6 months and occur between May and November, 1999.

Stage 4-Relocate Frog Eggs in Habitat and Exclude San Francisco Garter Snakes from the Project Area: Stage 4 will last for approximately 1-2 months during January and February of 2000. Based on observations of red-legged frogs at the project site, it is assumed that adult red-legged frogs are present in the pond on top of Crystal Springs Dam only during January and February to spawn. During this stage, adult frogs will have returned to the pond, spawned, and left again.

Surveys will be conducted in January and February 2000, to determine when red-legged frog adults leave the pond. Once it is clear that adult frogs are finished spawning and are no longer in the pond, a 3-foot tall solid fence will be installed to exclude small vertebrates (*e.g.*, garter snakes). The fence will be installed on the south side (outside) of the existing chain link fence which borders the south end of the pond. The fence will also extend several feet beyond the east face of the dam to prevent passage around this end. At the point where the western end of the existing chain link fence joins the bridge, the fence will extend south along the hillside adjacent to the road for approximately 50 feet. The fence will be built of tightly fitting, overlapping 4 x 8 foot plywood panels buried 1 foot below ground level.

At the same time that the exclusion fence is being installed, all red-legged frog egg masses in the pond will be moved from the pond. Eggs will be carefully floated into water-filled buckets and transported to a temporary facility. This facility will consist of several 8-foot diameter pools (the number of pools will depend on the number of eggs laid that season). Prior to moving the frogs, each pool will have substrate and aquatic plants gathered from the pond added to mimic natural conditions.

Each pool will be protected from predators and tampering by a locked cover of one-inch-square welded wire mesh. A partial shade awning will be positioned over a portion of each pool so that the light hitting these pools will be similar to that which reached the sunlit portion of the actual pond habitat. These ponds will be monitored by trained biologists on a regular basis. Egg hatching and larval development will be closely monitored during stages 5 through 8. The aquatic vegetation in each pool may decline

over time due to natural mortality or herbivory by tadpoles. If needed, additional aquatic vascular plants and algae could be added to each pool.

Stage 5-Install Protective Platform over Pond: In March of 2000, a protective cover will be installed over the pond to protect the pond from demolition and construction of the bridge above it. The concrete borders of the pond on top of Crystal Springs Dam will allow the structure to completely seal off the pond to prevent deposition of dust and debris during demolition and construction.

This protective platform will be constructed of steel beams placed horizontally between the west and east sides of the dam. The steel beams will be of variable lengths to fit into the stair-step of the interior walls of the dam. The beams will be covered by wood decking. Panels of styrofoam will also be used under the beams to float on the surface of the pond to further protect it from dust and small debris. This stage is expected to take approximately 2 weeks.

One side-effect of the sealing by this protective platform will be that the platform will eliminate light intercepting the pond. As a result, the aquatic vegetation within the pond will be lost. Plants salvaged during stage 4 will be used to replant the pond once the cover is removed.

Stage 6-Demolish Remaining Existing Bridge: Once the protective cover is in place, the remaining portion of the old bridge will be demolished. Stage 6 is expected to take approximately 2 weeks. The barrier walls on the north and west sides of the pond will be removed.

Stage 7-Construct Remaining New Bridge: From April to July, 2000, the remaining portion of the new bridge will be built.

Stage 8-Remove Protective Platform and Barrier Walls: Once stage 7 is complete, the protective platform over the pond will be removed.

Stage 9-Restore Habitat: Aquatic plants raised in pools at the larval-rearing facility will be positioned at various sites throughout the sunlit area of the pond. Beginning in August, 2000, red-legged frog larvae will be returned to the pond. It is expected that the frogs will metamorphose in early August and disperse into the upland habitat soon afterwards.

During this stage, the small vertebrate exclusion fence will be removed. After its removal, the newly-metamorphosed red-legged frogs will have access to the adjacent hillside once the fall rains provide a stimulus for movement. This stage is expected to take approximately 1 month.

Stage 10-Complete Bridge Approach Construction: Construction will be completed during this stage on the approaches to the new Crystal Springs Bridge. This stage is expected to take approximately 2 months.

Stage 11-Construction Complete: Construction should be completed by November, 2000, approximately 21 months after construction began. Construction will be completed approximately 1-2 months before adult red-legged frogs will be returning to the pond to spawn

Monitoring

To document the results of these minimization measures, the County proposes to monitor the pond for three years after construction is finished. Annual progress reports will be submitted to the Service during the implementation of these minimization measures. A final summary report at the end of the monitoring period will also be submitted to the Service.

To:

To avoid and minimize project effects to red-legged frogs and garter snakes during demolition and construction, the following minimization measures are proposed:

San Mateo County will implement the take avoidance and mitigation described below unless the pond is removed and compensated for by the separate proposed action of SFPUC's Lower Crystal Springs Dam Improvement Project (LCSDI), prior to or during the County Bridge replacement project, at which point SMC will cease its activity for impacts to the breeding pond.

Take Avoidance

Consultation with USFWS and DFG in September 2006 resulted in changes to the previously proposed take avoidance plan. The plan now focuses on protecting the CRLF population remaining after relocation of ½ the egg masses, instead of moving all CRLF egg masses out of the construction area to artificial rearing habitat. Instead, only a portion of the egg masses, unless approved by the Service, will be moved to a nearby natural breeding pond for CRLF and monitored until the eggs hatch (approximately 2-3 weeks). These changes were made based on new information on the behavior of the CRLF population in the top of dam pool and the knowledge that the pool will be completely lost during the implementation of a future SFPUC project. The specific change in CRLF behavior since the McGinnis surveys (1997-1998) is that juvenile and adult CRLF are now using the pond year round. The change to moving the CRLF to a natural pond on the watershed was made due to the fact that the pool on top of the dam will be permanently lost due to the SFPUC LCSDI project. Only ½ the egg masses are to be moved if the project proceeds at a time of year when egg mass removal is necessary, unless otherwise approved by the Service. This is in case the SFPUC project does not go forward and to keep some of the population intact.

To avoid and minimize project effects to red-legged frogs and garter snakes during demolition and construction, the following revised minimization measures are proposed:

1. The County shall retain a qualified biological monitor to be on-site during all phases of construction (staging, demolition, and bridge construction) and oversee the take avoidance measures. The biological monitor will make daily inspections prior to activities and will be available to relocate CRLF from areas where active construction or fencing alignments could result in take. The monitor(s) will also ensure that no take of SFGS occurs. The monitor will be present to inspect the project site, including the north and south approach areas. If a SFGS is observed, any construction that could result in take will be halted and the snake will be allowed to move out of the way of the construction.

2. The county shall install exclusion fencing in appropriate areas along Highway 35 (Skyline Blvd.) as approved by the Service and CDFG, to minimize the potential for CRLF or SFGS to encounter construction activity in this part of the project area.

3. Erect a fence to prevent red-legged frogs (and garter snakes) from exiting the pond to the north side of the pond during demolition and if needed during construction.

4. Protect the pond and all life stages of CRLF in the pond from disturbance from demolition while leaving a natural egress and ingress area at the southern end of the dam pool for CRLF to move safely in and out of the pool from the south end. This will allow access for frogs from the natural south side of the dam to the protected pond habitat but will ensure exclusion for the active area of bridge demolition.

5. After construction is complete, restore the pond to its pre-construction condition (replace lost plants, remove sedimentation to maintain pre-construction levels). Photographs will be taken of the pool and measurements taken of the various elements of the pond to document the pre-construction condition.

   In order to implement the proposed minimization measures, the demolition of the existing bridge and construction of the new bridge have been divided into several stages. These minimization measures shall occur at certain times of the year in order to coincide with the particular stages of red-legged frog development. The construction stages and schedule have been designed to:

   A. Avoid and minimize disturbance to the pond at the south end of the bridge where the top of dam pond is located.

   B. Minimize delays in the start and duration of construction.

   C. Minimize the disturbance to CRLF migrations to and from the pond.

Phase I - Habitat Enhancement Mitigation Plan

The County will enhance an area of approximately 25 acres of known red-legged frog breeding and garter snake foraging habitat within the immediate Crystal Springs Watershed. Bullfrogs breed in the LCR upper marsh and juveniles and adult bullfrogs occupy Tracy Lake. Other introduced predators present at the area include red-eared

sliders, painted turtles and soft shelled turtles. Swaim Biological found a painted turtle in the process of eating a treefrog in Tracy Lake on February 15, 2007. The proposed enhancement activity will consist of non-native predator control (bullfrog and non-native turtle) at one of the closest known CRLF breeding locations, Tracy Lake and the contiguous adjacent marsh. They are distinct or isolated enough that depredation of non-native predators can be beneficial to the co-occurring CRLF and SFGS population that are known to occur in Tracy Lake and the Upper Marsh of LCSR.. This is an important area of reproduction to the north of the dam pool. The predator control program will begin concurrently with the bridge replacement project start up. The depredation program will continue for two years.

Predator Control Techniques:

1. Removal of bullfrog egg masses (Anticipated late March – June)
2. Removal of larval, adult, and metamorphosed bullfrogs (Anticipated late March – October) via gigging, hand-capture, seining, and aquatic trapping.
3. Removal of non-native turtles (Anticipated late March – October) via gigging, hand-capture, seining, and aquatic trapping. Non-native turtles will be taken to local turtle rescue centers, including the Bay Area Turtle and Tortoise Rescue Center in Castro Valley, to the extent they will accept them. Additional individuals will be retained for live display in public education or euthanized as necessary.

Reporting

Annual reports on the timing, age class and numbers of predators removed will be submitted to the Service and Department of Fish and Game by December 31 of each monitoring year. The 2009 report will provide a baseline evaluation. The 2010 and 2011 reports will provide an evaluation of the success of the depredation techniques as well as any information gathered on the target sensitive species using the mitigation area (CRLF, SFGS, and WPT). Baseline monitoring of the bullfrog and non-native turtle populations in the mitigation area will be conducted prior to eradication efforts and again in year 1 and 2. An analysis will be made to determine if there is a measurable reduction in the non-native predator population over the life of the mitigation effort.

Phase II - Demolition

Stage 1-Relocate ½ of the Frog Eggs Masses in Habitat and Exclude San Francisco Garter Snakes from the Project Area (north of the pond):

Stage 1 will last for approximately 3-4 months, prior to any demolition beginning. Surveys will be conducted in December, January and February, and early March, to determine when red-legged frogs breed and when they are finished spawning if the BO is issued at a time of year that makes egg mass relocation feasible. If the Biological Opinion is issued later, a minimum of ½ the tadpole population will be relocated to the Tracy Lake area. If no tadpoles are present, no relocation effort will be needed. CRLF usually synchronize breeding such that multiple egg masses will be deposited in a single

rain event over a period of 1 day or several days and eggs hatch within 6-14 days of spawning. This will allow biologists to make regular visits during the breeding season and relocate only approximately ½ of the egg masses from the pond after each breeding event and leave approximately ½ to complete metamorphosis in the dam pool as requested by USFWS and DFG.

Stage 2-Install Vertical Barrier around Pond:

Bridge demolition is proposed to begin in April 2010 at the north end of the bridge. A temporary plywood barrier wall will be constructed several feet beyond the north end of the pond basin. This wall will extend vertically from the top of the dam to the underside of the existing bridge and extend horizontally across the width of dam and project approximately three feet beyond the east face of the dam. A second wall will also be constructed along the west edge of the pond (*i.e.*, the west face of the dam). This wall will also extend vertically from the top of the dam to the underside of the existing bridge. Tight seals will be made between all wall segments and the concrete of the dam and bridge which they join. These two walls will effectively seal off the entire pond from most of the bridge and dam. The south and east sides of the pond will remain open so that plants in the pond will receive light. In addition, red-legged frogs that metamorphose in the spring and summer will be able to leave the pond as usual with the onset of fall rains.

Day and night visual surveys will then be conducted in March to verify that no adult or juvenile CRLF are present on the top of the dam north of the barrier wall. Any CRLF found on top of the dam north of the barrier wall, will be relocated to the pond area.

Once demolition reaches the area of the bridge over the pond, a 3-foot tall solid fence consisting of a combination of plywood and heavy duty geotextile fabric will be installed to exclude small vertebrates (*e.g.*, garter snakes) from the pond. Exit funnels will be installed in the fence every 10 feet on the south end of the barrier where it abuts terrestrial habitat. This fence will be in place only for a limited period. That period is limited to the time during which the demolition of the bridge segment directly over the pond is occurring. The fence will be installed on the south side (outside) of the existing chain link fence, which borders the south end of the pond. The fence will also extend several feet beyond the east face of the dam to prevent passage around this end. At the point where the western end of the existing chain link fence joins the bridge, the fence will extend south along the hillside adjacent to the road for approximately 50 feet. The fence will be built of tightly fitting, overlapping plywood panels buried 6 inches to 1 foot below ground level or secured to the concrete or of heavy duty silt fence as approved by USFWS/DFG.

Stage 3-Install Protective Platform over Pond:

A plywood protective cover will be installed over the pond prior to bridge demolition to protect the pond from demolition and construction of the bridge above it. The concrete borders of the pond on top of Crystal Springs Dam will allow the structure to be nearly completely sealed off from the pond to prevent deposition of dust and debris during

demolition and construction. The platform will be elevated so that light will still be able to enter the pond while still providing ample protection from any falling debris. The platform will have flared awnings on the north, south, and east sides that deflect dust away from the pond. Dust curtains will be installed on the edge of the north, south and east side of the platform awning. During construction, dust levels will be monitored near the pond. If needed, dust shields will be placed to further reduce the chances that significant levels of dust will reach the pond. This will allow more control of light into the pond area than a permanent and fixed structure to seal off the pond.

This protective platform will be constructed of steel beams placed horizontally between the west and east sides of the dam. Temporary footings may be required in the pond area to support the steel beams. These beams will be covered by removable wood decking to protect the pond from falling debris from the demolition and construction of the bridge.

One side-effect of the covering for the protective platform will be that the platform may reduce light intercepting the pond. As a result, some aquatic vegetation within the pond may be lost, but this is expected to be a minimal amount, if at all. Stage 3 is expected to take approximately 2 weeks to install and remain in place as required to protect the pond.

Stage 4-Demolish Existing Bridge North of the Pond:

Once the barrier wall has been installed to prevent vertebrates from exiting the pond to the north, demolition will begin on the bridge north of the pond area. In April 2010 - August 2010 most of the existing Crystal Springs Bridge will be demolished. Demolition will occur from the north end of the bridge to the barrier wall.

Stage 5- Demolish Existing Bridge Over of the Pond:

Once the protective cover is in place, the remaining portion of the old bridge will be demolished. Stage 5 is expected to take approximately 2 months (August – October 2010).

Stage 6-Construct New Bridge: The new bridge construction will commence by 2013. The new bridge will be constructed upon completion of the SFPUC Lower Crystal Springs Dam Improvement Project.

Stage 7-Remove Protective Platform and Barrier Walls: Once stage 6 is complete, the protective platform over the pond will be removed, if it has not already been removed due to the SFPUC LCSDI project.

Stage 8-Restore Habitat: If the SFPUC does not construct their LCSDI project, aquatic plants will be planted at various sites throughout the sunlit area of the pond if needed. During this stage, the small vertebrate exclusion fence will be removed. After its removal, the newly-metamorphosed red-legged frogs will have access to the adjacent hillside once the fall rains provide a stimulus for movement. This stage is expected to take approximately 1 month.

Stage 9-Complete Bridge Approach Construction: Construction will be completed during this stage on the approaches to the new Crystal Springs Bridge. This stage is expected to take approximately 2 months. During construction take avoidance measures will include hand excavation of burrows that could potentially be used by the San Francisco garter snake and an on-site qualified biological monitor will be present.

Stage 10-New Bridge Construction Complete: New bridge construction is expected to take approximately 12 months to complete.

3. **Delete the following on the first paragraph on page 16 under the Description of the Proposed Action:**

   a. Red-legged frogs shall be reared within SFPUC land immediately downstream of the Crystal Springs dam on the north side of San Mateo Creek in a location approved by the Service.

4. **Delete the following on the third paragraph page 16 through page 17 under the Description of the Proposed Action:**

   I. Prior to the implementation of Stage 4 activities, a Service-approved conservation easement shall be placed on the newly created/restored pond(s) for the protection of red-legged frogs and garter snakes and their habitat in perpetuity from further development. The easement shall include, but not be limited to, provisions and responsibilities of the County and SFPUC for the protection of the pond(s) including any future transfers of the easement or fee interest that may be anticipated. The Service shall receive a true copy of the recorded conservation easement within 30 days of its recordation. The easement shall be held by a third party approved by the Service. The easement shall include a list of prohibited activities that are inconsistent with the maintenance of the preserve(s) for the listed species, including, but not limited to:

      (1) leveling, grading, landscaping, cultivation, or any other alterations of existing topography for any purposes, including the exploration for, or development of, mineral resources;

      (2) placement of any new structures on the preserve, including buildings and billboards;

      (3) discharge, dumping, burning, or storing of rubbish, garbage, grass clippings, dredge material, household chemicals, or any other wastes or fill materials within the preserve(s);

      (4) building of any new roads or trails within the preserve(s);

      (5) operating a motor vehicle within the preserve(s);

(6) killing, removal, alteration, or replacement of any existing native vegetation;

(7) activities that may alter with the hydrology of the preserve(s) and the associated watersheds, including but not limited to: excessive pumping of groundwater, manipulation or blockage of natural drainages, inappropriate water application or placement of storm water drains, etc.;

(8) incompatible fire protection activities;

(9) livestock grazing, except as described in a Service-approved management plan;

(10) use of pesticides, herbicides, or rodenticides on the preserve or within the watershed that can contaminate the preserve; and

(11) introduction of any exotic species, including aquatic species;

ii. The County shall establish an adequate endowment fund for monitoring and perpetual management and maintenance of the pond(s). The principal in the endowment must generate sufficient revenue to cover the costs of alien species removal, maintenance of fencing, monitoring of red-legged frogs, and remediation of indirect effects in perpetuity. This endowment shall be made to a Service-approved entity prior to the implementation of stage 4 activities. Specific actions covered under the endowment shall be addressed in the Mitigation and Management Plan (further described below). A third party selected by the applicant and approved by the Service, the County, and California Department of Fish and Game (CDFG) shall work with the applicant to determine what amount of money is necessary for an endowment fund to adequately finance the monitoring and perpetual management and maintenance of the preserve and mitigation area(s).

iii. Prior to implementing Stage 4 activities, the applicant shall provide the Service and the FHWA documentation that: (1) funds for the perpetual management of the pond(s) have been transferred to the appropriate third-party approved by the Service and the FHWA; (2) the third party has accepted the funds and considers them adequate; and (3) that these funds have been deposited in an account (*i.e.* endowment) that will provide adequate financing for the monitoring and perpetual management and maintenance of the preserve and mitigation area.

5. Delete the following on Page 17, Term and Condition, number 1(b) (iv):

iv. A Mitigation and Management Plan for the pond shall be completed. A draft of the Mitigation and Management Plan shall be submitted to the

Service for review and approval prior to the initiation of Stage 4. The final Mitigation and Management Plan shall be submitted to the Service by March 2000. This Mitigation and Management Plan shall include, but not be limited to:

(1) discussions of the management and maintenance in perpetuity of the wetland habitat for the red-legged frogs and garter snakes, including documentation that adequate funds exist for the monitoring and perpetual management and maintenance of the pond;

(2) discussions of runoff control and maintenance of hydrology of the aquatic habitat;

(3) provisions for a monitoring program to be set up and implemented with a monitoring report every year that addresses the ecological functions of the preserve;

(4) Reasonable access to the preserve shall be allowed with a 24-hour notice by the Service, FHWA, or CDFG, and/or other appropriate agencies.

(5) Dewatering devices shall be installed that are able to remove all standing water from the pond(s) for the control of bullfrogs.

Closing Statement

The remainder of the March 15, 1999 biological opinion is unchanged. This concludes the formal consultation on the San Mateo County Crystal Springs replacement project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this amendment to the biological opinion for the Crystal Springs Dam Bridge Replacement, please contact Vincent Griego or Ryan Olah of my staff via electronic mail at Vincent_Griego@fws.gov, Ryan_Olah@fws.gov, or telephone at (916) 414-6625.

Sincerely,

for Susan K. Moore
Field Supervisor

cc:
Scott Wilson, California Department of Fish and Game, Yountville, CA
Ann Stillman, County of San Mateo, Department of Public Works, Redwood City, CA
Giles Tourel, County of San Mateo, Department of Public Works, Redwood City, CA

APPENDIX F

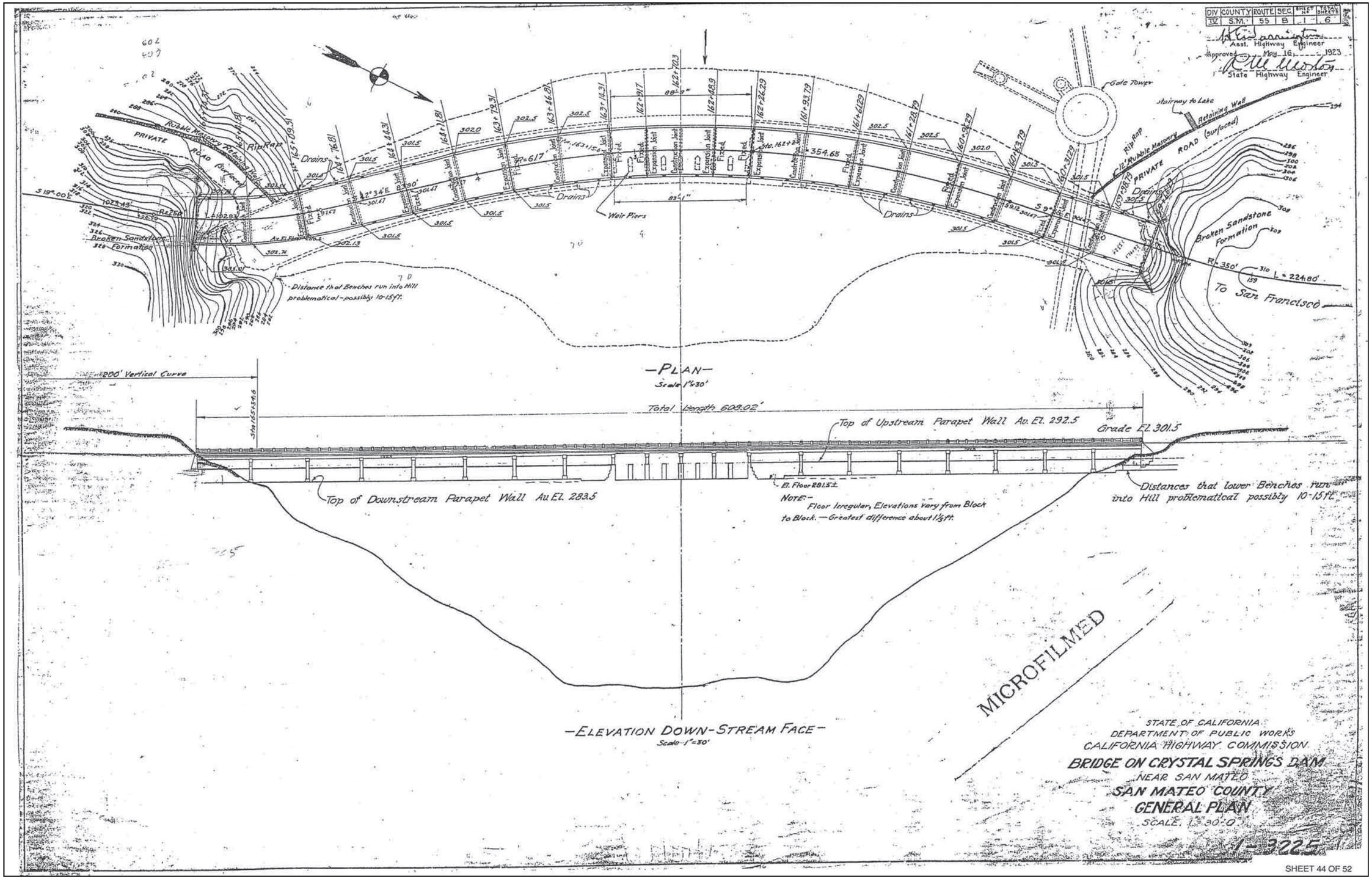
Existing and Proposed Bridge Cross-Section Drawings

DIV	COUNTY	ROUTE	SEC.	SHEET NO.	TOTAL SHEETS
IV	S.M.	55	B	1	6

Asst. Highway Engineer

Approved May 16, 1923

State Highway Engineer



MICROFILMED

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
CALIFORNIA HIGHWAY COMMISSION.

BRIDGE ON CRYSTAL SPRINGS DAM
NEAR SAN MATEO
SAN MATEO COUNTY
GENERAL PLAN
SCALE, 1"=30'-0"

1-3225

SHEET 44 OF 52

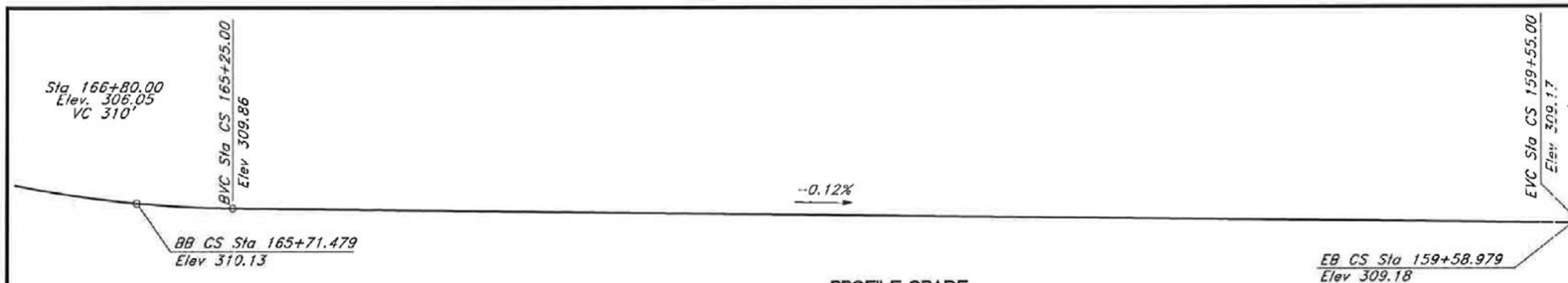
Source: County of San Mateo, 2008 — *Crystal Springs Dam Bridge Replacement Project*

Existing Bridge Cross-Section

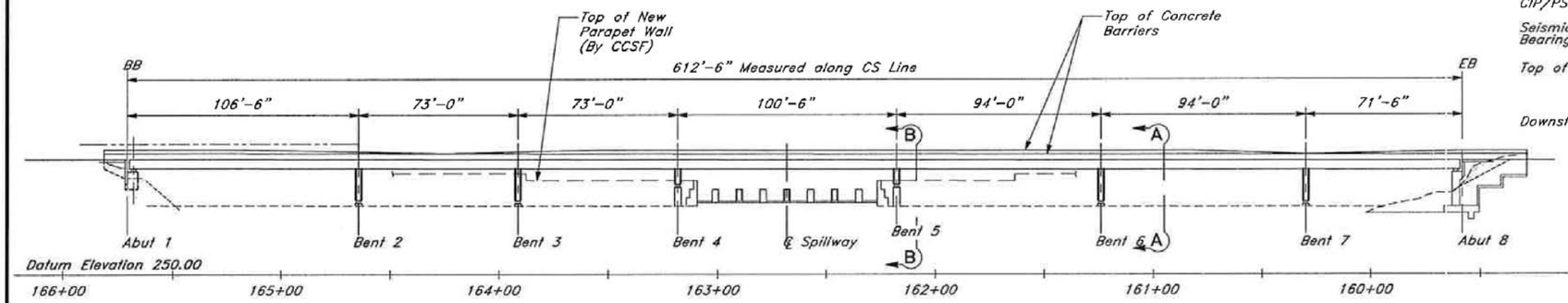
APPROVED:

DATE: _____

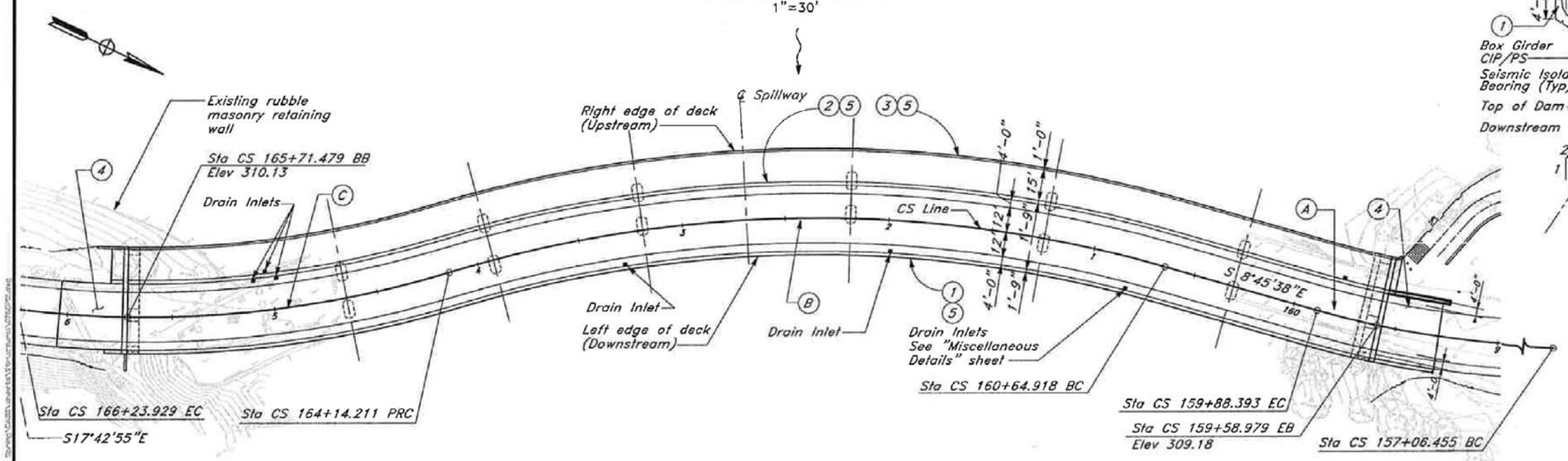
JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS

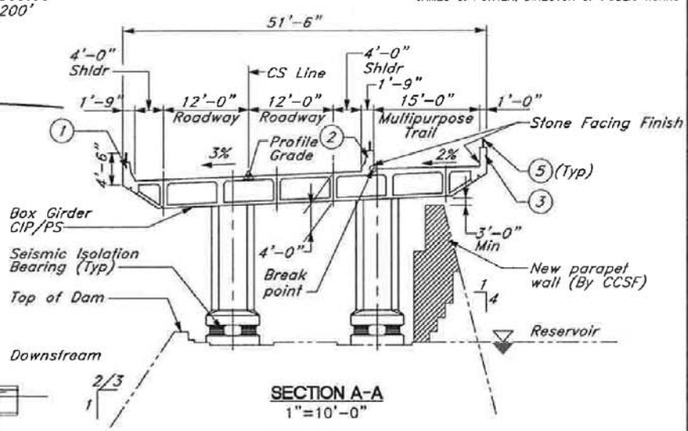


PROFILE GRADE
1"=30'-0"

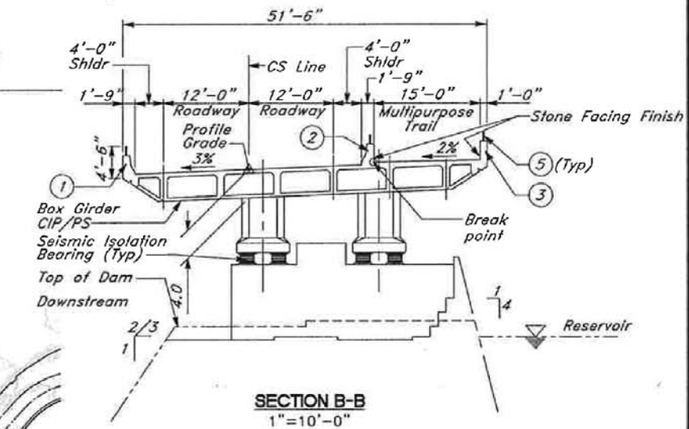


DEVELOPED ELEVATION
1"=30'





SECTION A-A
1"=10'-0"



SECTION B-B
1"=10'-0"

LEGEND:

1. Exterior Concrete Barrier, Type 25 modified
2. Interior Concrete Barrier, Type 25 modified
3. Exterior Concrete Barrier, Type 26 modified
4. Structural Concrete Approach Slab
5. Metal Tube Bridge Railing

CURVE DATA – CS Line

NO.	R	△	T	L	Coordinates N	Coordinates E
(A)	439.800	36°34'00"	145.310	280.680	380488.714	1460141.781
(B)	606.700	32°59'12"	179.640	349.290	380167.309	1460878.522
(C)	500.000	24°01'55"	106.420	209.720	379674.966	1460529.115

PLAN
1"=30'

APPROVED DATE:

PB PARSONS BRINCKERHOFF
303 SECOND STREET, SUITE 700 NORTH
SAN FRANCISCO, CA 94107

R. C. E. # / EXPIRES

DESIGNED BY:
CHECKED BY:
DRAWN BY:

REVISION | DATE

JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS
SAN MATEO COUNTY

555 COUNTY CENTER, 5TH FLOOR
REDWOOD CITY, CALIFORNIA

CRYSTAL SPRINGS DAM BRIDGE
GENERAL PLAN

SCALE: AS NOTED
DATE: 06/13/08
FILE NO.: S001

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

SHEET 15 of 52

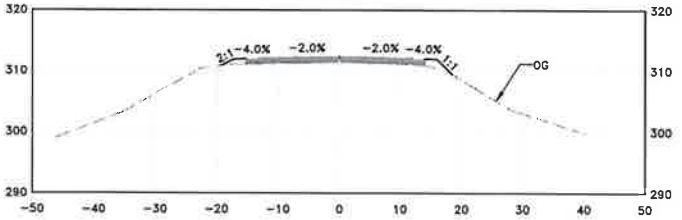
T:\13271\DWG\ 07GP01.DWG

APPROVED:

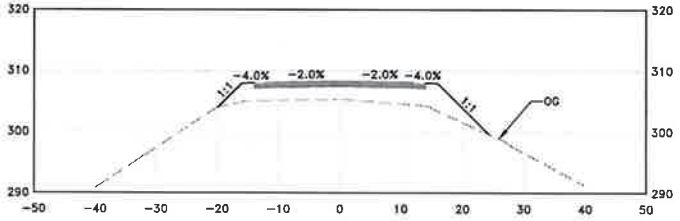
DATE: _____

JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS

154+00.00



155+00.00



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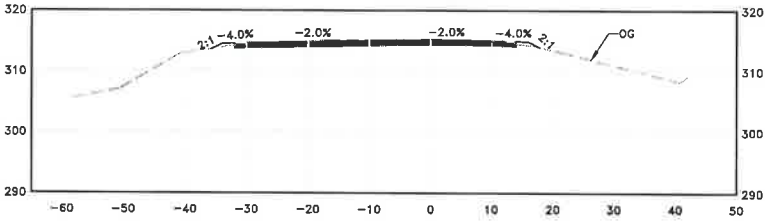
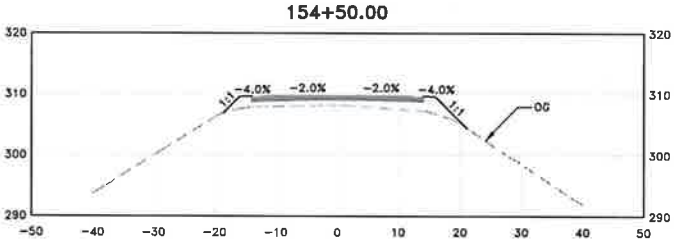


154+50.00



PRELIMINARY

SCALE: 1"=10'

APPROVED DATE:	
PB PARSONS BRINCKERHOFF 303 SECOND STREET, SUITE 700 NORTH SAN FRANCISCO, CA 94107	
R. C. E. # / EXPIRES	

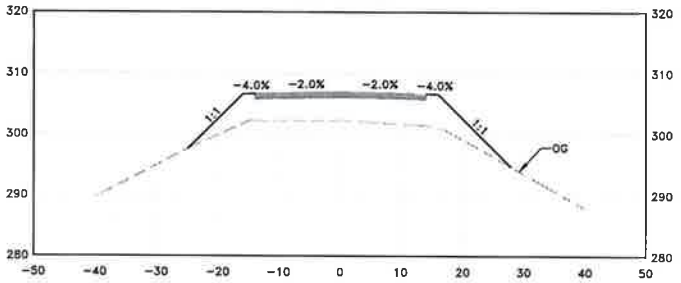
		DESIGNED BY:	CRYSTAL SPRINGS DAM BRIDGE TYPICAL SECTIONS	SCALE: AS NOTED
		CHECKED BY:		DATE:
		DRAWN BY:		FILE NO.:
REVISION	DATE	JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS SAN MATEO COUNTY		555 COUNTY CENTER, 5TH FLOOR REDWOOD CITY, CALIFORNIA
		FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4		SHEET 11 of 82

APPROVED:

DATE: _____

JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS

156+00.00



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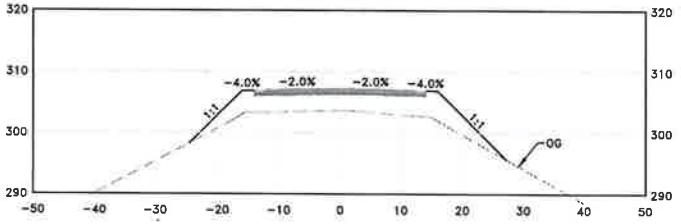

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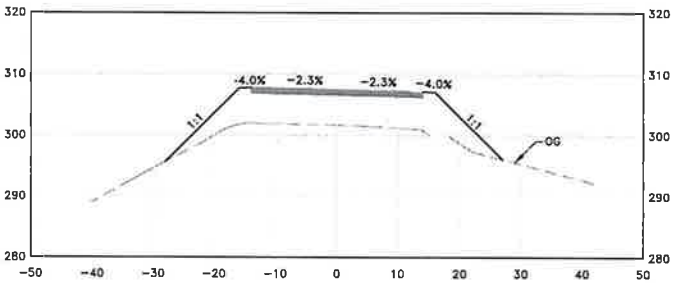

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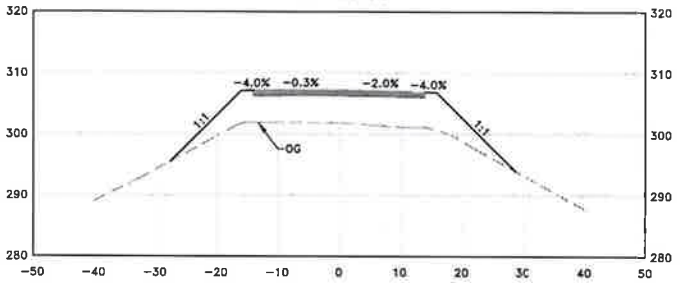


PRELIMINARY

SCALE: 1"=10'

APPROVED DATE:

PB PARSONS BRINCKERHOFF

303 SECOND STREET, SUITE 700 NORTH
SAN FRANCISCO, CA 94107

R. C. E. # / EXPIRES

REVISION	DATE	
		DESIGNED BY:
		CHECKED BY:
		DRAWN BY:

CRYSTAL SPRINGS DAM BRIDGE
TYPICAL SECTIONS

JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS
SAN MATEO COUNTY

555 COUNTY CENTER, 5TH FLOOR
REDWOOD CITY, CALIFORNIA

SCALE: AS NOTED
DATE: 06/13/08
FILE NO.:

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

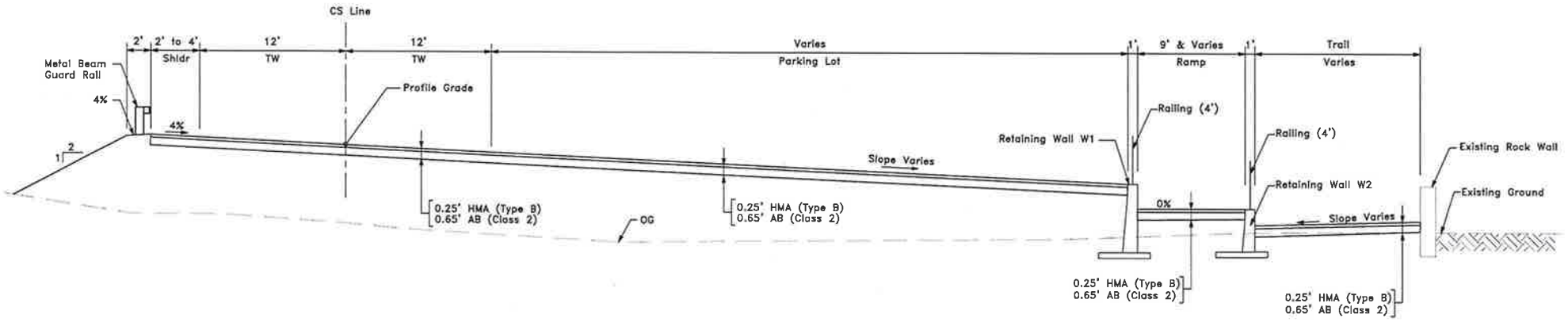
SHEET 11 of 82

APPROVED:

DATE: _____

_____

JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS



SECTION
CS 157+43 TO CS 159+28.98
SCALE: 1"=4'

PRELIMINARY

APPROVED DATE:	
PB PARSONS BRINCKERHOFF 303 SECOND STREET, SUITE 700 NORTH SAN FRANCISCO, CA 94107	
R. C. E. # / EXPIRES	

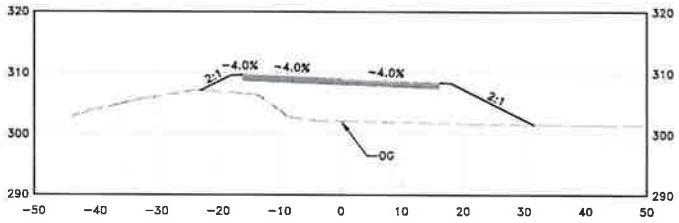
		DESIGNED BY:	CRYSTAL SPRINGS DAM BRIDGE TYPICAL SECTIONS	SCALE: AS NOTED
		CHECKED BY:		DATE:
		DRAWN BY:		FILE NO.:
REVISION	DATE	JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS SAN MATEO COUNTY	555 COUNTY CENTER, 5TH FLOOR REDWOOD CITY, CALIFORNIA	
FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4				SHEET 11 of 52

APPROVED:

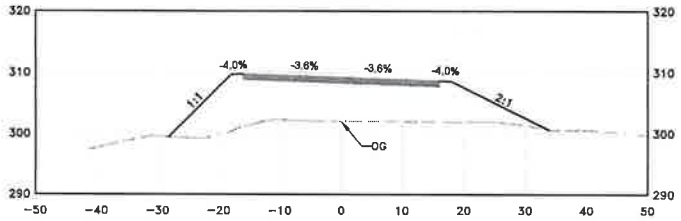
DATE: _____

JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS

159+40.00



159+58.98



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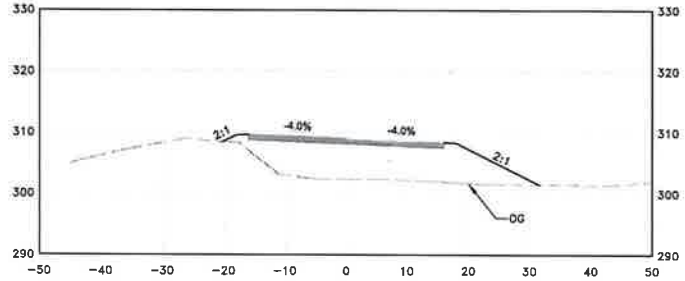

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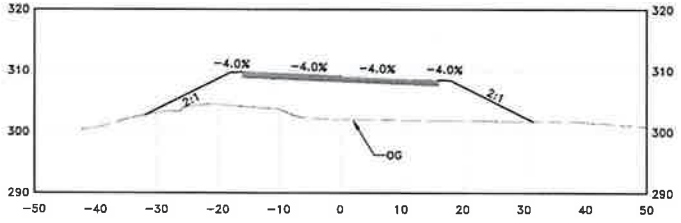

PRELIMINARY

SCALE: 1"=10'

APPROVED DATE:	
PB PARSONS BRINCKERHOFF 303 SECOND STREET, SUITE 700 NORTH SAN FRANCISCO, CA 94107	
R. C. E. # / EXPIRES	

		DESIGNED BY:	CRYSTAL SPRINGS DAM BRIDGE TYPICAL SECTIONS	SCALE: AS NOTED
		CHECKED BY:		DATE: 06/13/08
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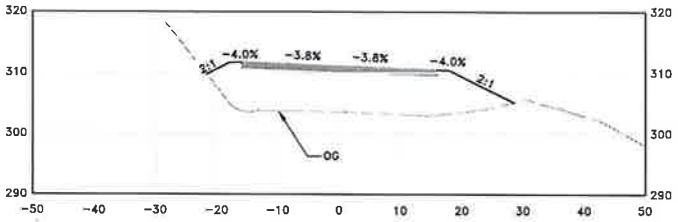
		JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS SAN MATEO COUNTY		555 COUNTY CENTER, 5TH FLOOR REDWOOD CITY, CALIFORNIA
REVISION	DATE			
FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES		0 1 2 3 4		SHEET 11 of 82

APPROVED:

DATE: _____

JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS

166+00.00



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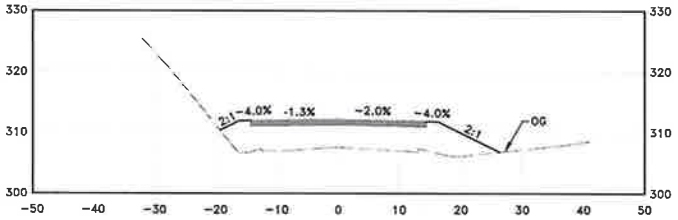

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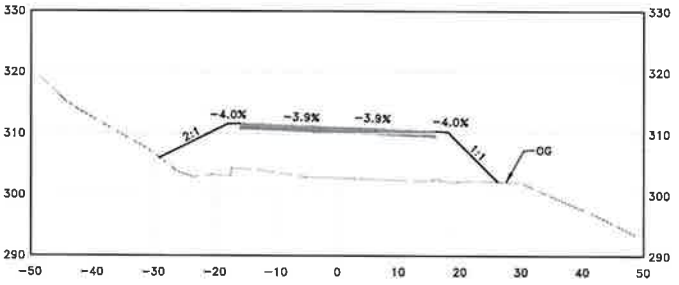

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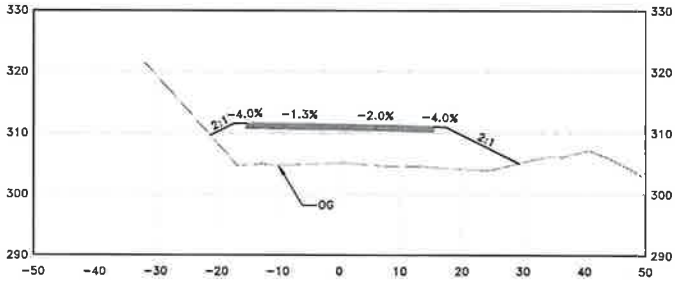


PRELIMINARY

SCALE: 1"=10'

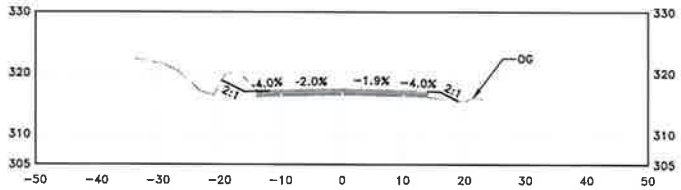
APPROVED DATE:		DESIGNED BY:	CRYSTAL SPRINGS DAM BRIDGE	SCALE: AS NOTED
PB PARSONS BRINCKERHOFF		CHECKED BY:	TYPICAL SECTIONS	DATE: 06/13/08
303 SECOND STREET, SUITE 700 NORTH SAN FRANCISCO, CA 94107		DRAWN BY:		FILE NO.:
R. C. E. # / EXPIRES	REVISION / DATE	JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS SAN MATEO COUNTY	555 COUNTY CENTER, 5TH FLOOR REDWOOD CITY, CALIFORNIA	
		FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4		SHEET 11 of 52

APPROVED:

DATE: _____

JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS

168+50.00



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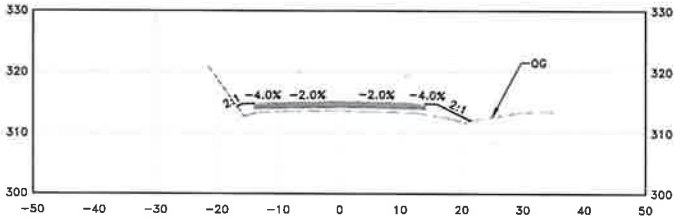

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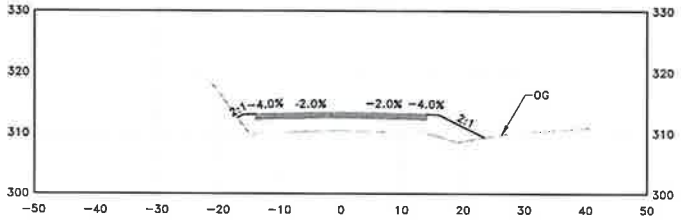

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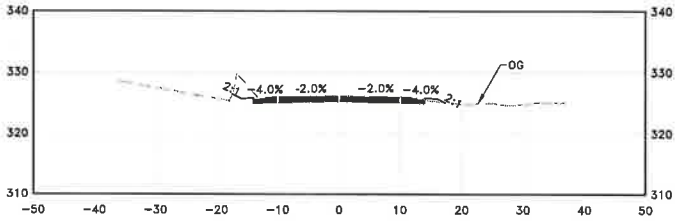

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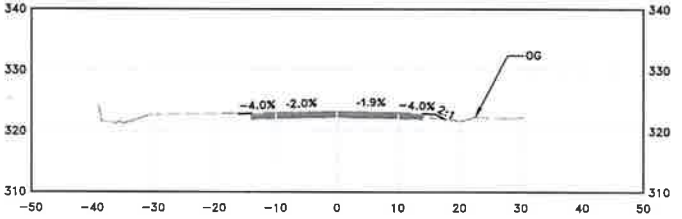

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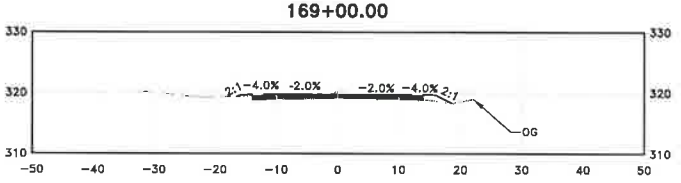

PRELIMINARY

SCALE: 1"=10'

APPROVED DATE:

PB PARSONS BRINCKERHOFF

303 SECOND STREET, SUITE 700 NORTH
SAN FRANCISCO, CA 94107

R. C. E. # / EXPIRES

REVISION	DATE	DESIGNED BY:	CRYSTAL SPRINGS DAM BRIDGE TYPICAL SECTIONS	SCALE: AS NOTED
		CHECKED BY:		DATE: 06/13/08
		DRAWN BY:		FILE NO.:
		JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS SAN MATEO COUNTY	555 COUNTY CENTER, 5TH FLOOR REDWOOD CITY, CALIFORNIA	

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

SHEET 11 of 52

APPENDIX G

Construction Detour Routes

Source: ENTRIX, Inc., 2008

Crystal Springs Dam Bridge Replacement Project

Appendix G

Construction Detour Routes