

Ferguson Slide Permanent Restoration Project

On State Route 140 from 8 miles east of Briceburg to
7.6 miles west of El Portal in Mariposa County, California

District 10-MPA-140-PM 42.0/42.7

1000000198

SCH# 2008011118

Draft Environmental Impact Report/ Environmental Impact Statement and Section 4(f) Evaluation



Prepared by the
State of California Department of Transportation

The environmental review, consultation, and any other action required in accordance with applicable federal laws for this project is being, or has been, carried out by the California Department of Transportation under its assumption of responsibility pursuant to 23 U.S. Code 327.

November 2010



General Information About This Document

What's in this document?

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration, has prepared this Environmental Impact Report/Environmental Impact Statement, which examines the potential environmental impacts of alternatives being considered for the proposed project located in Mariposa County, California. The document describes why the project is being proposed, alternatives for the project, the existing environment that could be affected by the project, potential impacts from each of the alternatives, and the proposed avoidance, minimization, and/or mitigation measures.

What should you do?

- Please read this Draft Environmental Impact Report/Environmental Impact Statement. Additional copies of it, as well as of the technical studies we relied on in preparing it, are available for review at the Caltrans district office at 1976 Dr Martin Luther King Jr. Blvd, Stockton, CA 95201, the Mariposa County Library at 4978 10th Street, Mariposa, CA 95338, and the El Portal Post Office at 5508 Foresta Road, El Portal, CA 95318.
- Attend the public hearings on December 8, 2010 in Mariposa or December 9, 2010 in El Portal.
- We welcome your comments. If you have any concerns regarding the proposed project, please attend the public hearings or send your written comments to Caltrans by the deadline. Submit comments via U.S. mail to Caltrans at the following address: Kirsten Helton, Senior Environmental Planner, Central Region, California Department of Transportation, 2015 E. Shields Avenue, Suite 100, Fresno, CA 93726.
- Submit comments via email to: kirsten_helton@dot.ca.gov.
- Submit comments by the deadline: January 13, 2011.

What happens next?

After comments are received from the public and reviewing agencies, Caltrans, as assigned by the Federal Highway Administration, may do additional environmental and/or engineering studies. A Final Environmental Impact Report/Environmental Impact Statement will be circulated; the final document will include responses to comments received on the Draft Environmental Impact Report/Environmental Impact Statement and will identify the preferred alternative. Following circulation of the Final Environmental Impact Report/Environmental Impact Statement, if the decision is made to approve the project, a Notice of Determination will be published for compliance with the California Environmental Quality Act and a Record of Decision will be published for compliance with the National Environmental Policy Act. If the project is given environmental approval and funding is appropriated, Caltrans could design and construct all or part of the project.

For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Kirsten Helton, Senior Environmental Planner, Central Region, 2015 E. Shields Avenue, Fresno, CA 93726; 559-243-8224 Voice, or use the California Relay Service TTY number, 1-800-735-2929.

Restore full highway access between the communities of Mariposa and El Portal via State Route 140 from 8 miles east of Briceburg to 7.6 miles west of El Portal in Mariposa County (post miles 42.0 to 42.7)

**DRAFT ENVIRONMENTAL IMPACT REPORT
/ENVIRONMENTAL IMPACT STATEMENT
and Section 4(f) Evaluation**

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 U.S. Code 4332(2)(C) and 49 U.S. Code 303

THE STATE OF CALIFORNIA
Department of Transportation
And
The United States Forest Service
The United States Army Corps of Engineers
The National Park Service
The Bureau of Land Management
The California Department of Fish and Game
The United States Environmental Protection Agency

11/5/10

Date of Approval



Richard Harmon
District Director, District 10
California Department of Transportation
NEPA Lead Agency

11/5/10

Date of Approval



Richard Harmon
District Director, District 10
California Department of Transportation
CEQA Lead Agency

The following persons may be contacted for additional information concerning this document:

Kirsten Helton, Senior Environmental Planner, Central Region, 2015 E. Shields Avenue, Suite 100
Fresno, CA 93726, (559) 243-8224

Abstract: The California Department of Transportation (Caltrans) proposes to restore full highway access along State Route 140 in Mariposa County at the section damaged by the Ferguson rockslide. Restoration of State Route 140 would eliminate the detour and provide full access (with the same restrictions on vehicle length that were in place before the slide) to all traffic using State Route 140 between the town of Mariposa and Yosemite National Park. Potential project impacts are described, which include any impacts to the Merced River (designated as a Wild and Scenic River).

If you have any concerns regarding the proposed project, please send your written comments to Caltrans by the deadline. Submit comments via U.S. mail to Caltrans at the following address: Kirsten Helton, Senior Environmental Planner, Central Region, California Department of Transportation, 2015 E. Shields Avenue, Suite 100, Fresno, CA 93726. Submit comments by January 13, 2011.

Summary

The proposed project is a joint effort by the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA), and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans is the lead agency under CEQA. In addition, FHWA's responsibility for environmental review, consultation, and any other action required in accordance with applicable federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327.

Following receipt of public comments on the Draft Environmental Impact Report/Environmental Impact Statement and circulation of the final document, Caltrans will be required to determine whether to certify the Environmental Impact Report and issue Findings and a Statement of Overriding Considerations under CEQA. Caltrans, as assigned by the Federal Highway Administration, will document and explain its decision regarding the selected alternative, project impacts, and mitigation measures in a Record of Decision in accordance with the National Environmental Policy Act.

Overview of Project Area

The project is located on State Route 140 in Mariposa County, from 8 miles east of Briceburg, a tiny community anchored by a Bureau of Land Management Visitor's Center, to 7.6 miles west of El Portal (post miles 42.0 and 42.7) where the Ferguson rockslide covered the highway with 798,000 tons of rock and debris. Within the limits of the proposed project and prior to the Ferguson rockslide, State Route 140 was a two-lane, undivided highway. Following the rockslide and the completion of a temporary detour, State Route 140 now bridges the Merced River, bypassing the rockslide, as a one-lane road. This bypass route provides for one-directional traffic that is controlled by signalized lights. The Merced River runs alongside the highway within the project area, as it does throughout the Merced River Canyon. There are no other proposed or ongoing projects within the project vicinity.

Purpose and Need

The first rockslides within the Merced River Canyon began on April 29, 2006. Since April 2006, rockslides have damaged and blocked a substantial portion of State Route

140 between Mariposa and El Portal. The Ferguson rockslide closed State Route 140 to traffic from 8 miles east of Briceburg to 7.6 miles west of El Portal.

The purpose of the project is to reopen and restore full highway access between Mariposa and El Portal via State Route 140. Full highway access for this portion of State Route 140 means a two-lane, all-weather highway that would accommodate all types of vehicles with some length restrictions, equivalent to the restrictions that were in place before the slide occurred. Currently, motorists use a temporary, one-lane bypass route to avoid the portion of State Route 140 that was closed by the Ferguson rockslide. This bypass route imposes substantial restrictions on the size and type of vehicles that can travel along State Route 140. It also requires that traffic stop and queue before entering the one-lane bypass route when the traffic signal indicates the way is clear. Restoration of State Route 140 would eliminate the detour and provide full access to all traffic on State Route 140 between the town of Mariposa and Yosemite National Park. Yosemite National Park and communities in Mariposa County rely heavily on this access for many types of transportation that serve tourism and residents of the area. State Route 140 is an essential element in supplying goods and services to the Mariposa and Yosemite communities. Six build alternatives and one no-build alternative are being considered.

Proposed Action

The California Department of Transportation (Caltrans) proposes to restore full highway access between Mariposa and El Portal via State Route 140 in Mariposa County, California by repairing or permanently bypassing the portion of State Route 140 that was blocked and damaged by the Ferguson rockslide. The total length of the project is 0.7 mile. The following build alternatives are being proposed:

Alternative C (Open-cut Realignment)

This alternative would realign the highway to the northeast of its current alignment, spanning the Merced River and bypassing the rockslide. State Route 140 would cut through the mountain across the Merced River from the rockslide and then span back across the river where it would meet the existing alignment. Two bridges would be built across the river.

Alternative T (Tunnel Realignment)

This alternative would realign the highway to the northeast of its current alignment, spanning the Merced River and bypassing the rockslide. State Route 140 would tunnel 700 feet through the mountain across the Merced River from the rockslide and

then span back across the river where it would meet the existing alignment. Two bridges would be built across the river.

Alternative T-3 (Tunnel under Slide Realignment)

This alternative would realign the highway by constructing a 2,200-foot-long tunnel under the area of the slide.

Alternative S (Viaduct Realignment)

This alternative would realign the highway to the northeast of its current alignment, spanning the Merced River with two bridges and bypassing the rockslide with a hillside viaduct and retaining wall.

Alternative S-2 (Modified Viaduct Realignment)

This alternative is similar to Alternative S and would realign the highway to the northeast of its current alignment, spanning the Merced River with two bridges and bypassing the rockslide with a hillside viaduct and retaining wall. This alternative differs from Alternative S in that it proposes two bridge type variations along with their own specific roadway alignments. The first (S2-V1) would construct two tied-arch bridges, which use an arch structure with cables above the bridge deck for support. The second (S2-V2) would construct two slant-leg bridges, which use “V”-shaped columns to support the bridge deck.

Alternative R (Rockshed/Tunnel)

This alternative would construct a rockshed (cut-and-cover tunnel) through the talus (foundation layer) of the slide along the existing State Route 140 alignment.

No-build Alternative

The No-build Alternative would leave State Route 140 damaged and blocked by the Ferguson rockslide. As a result of the No-build Alternative, the temporary detour would continue to function as State Route 140. Either general wear or damage from flooding in a high water year will eventually require the removal of the bridges, supporting structures, and the detour pavement, leading to the permanent closure of State Route 140 at the section damaged by the rockslide.

General wear of both the temporary bridges and the structures that support them determines the varying lengths of their service lives. The actual steel bridges themselves may have a useful life of between 20 and 25 years. This estimate is based on normal wear, fatigue, and corrosion of the steel components. The structures

supporting the temporary bridges have a service life of 5 to 10 years. These support structures are actually what determine the useful age of the detour route.

The temporary detour was constructed during a declared emergency and was designed as a temporary solution to the closure of State Route 140 after Caltrans reached an agreement with the U.S. Forest Service that the pavement and structures used for the detour would be removed once a permanent solution could be constructed. The No-build Alternative requires the same environmental analysis as the proposed build alternatives.

Project Impacts

Wild and Scenic River

Wild and Scenic rivers are defined by resources that contribute to that designation; these resources are termed *outstandingly remarkable values* by the Wild and Scenic Rivers Act. Such values include the free-flowing nature of the river and its value as a recreational facility. Alternatives C, T, and S would impede the free-flowing nature of the Wild and Scenic-designated Merced River by constructing bridge piers within the wild and scenic river boundaries as determined by the U.S. Forest Service. Additional impacts to the outstandingly remarkable value as a recreational facility could occur because the proposed bridge piers would also be placed in the river flow, obstructing whitewater rafting. The No-build Alternative would present short-term impacts from the temporary bridges as they would impede the free flow of the river should the water level exceed the two-year flood flow. The No-build Alternative temporary bridges would eventually be removed out of the free-flowing section of the river, and this would result in the closure of the highway and eliminate access to river recreational users from the portion of State Route 140 damaged by the rockslide. Alternatives R and T-3 would not affect the Merced River as a recreational facility.

Visual/Aesthetics

Alternatives C, T, S, and S-2 would add larger concrete bridge elements to the landscape and moderately decrease the visual quality of the landscape within the project area. These larger bridges would also take the place of the smaller metal temporary bridges since their removal would be required. In the short-term, the temporary bridges of the No-build Alternative contribute metal bridge elements to the surrounding landscape, moderately decreasing the visual quality, but they would eventually be removed from the environment once they exhaust their useful lifespan and the landscape would be restored to a natural setting free of bridge elements. Alternatives R and T-3 propose constructing the highway through new tunnels, which

would block a driver's view of the surrounding landscape and contribute to a slight decrease in the visual quality.

Plant Species

There are populations of a number of endangered, threatened or special concern species of plants and animals in the proposed project area. Alternatives C, T, S, and S-2 would not affect any Tompkins' sedge plant habitat during construction. The No-build Alternative would not affect any of this plant's habitat during its lifespan or upon its removal from the environment. Alternatives R and T-3 would cut into the slopes on the south side of the river where Tompkins' sedge habitat has been identified. Alternative R would affect 2.10 acres of habitat, and Alternative T-3 would affect 0.45 acre of habitat.

Alternatives C, T, S, and S-2 would completely avoid the known habitat of Mariposa clarkia. The No-build Alternative would not affect any of this plant's habitat during its lifespan or upon its removal from the environment. Alternatives R and T-3 would cut into the slopes on the south side of the river where populations of Mariposa clarkia have been identified. Alternative R would affect 2.10 acres of habitat, and Alternative T-3 would affect 0.45 acre of habitat.

Alternatives C, T, S, S-2, and the No-build would completely avoid potential habitat for Merced clarkia. Alternatives R and T-3 would cut into the slope on the south side of the river where unconfirmed observations of Merced clarkia were made. Although no confirmed sightings were made, the project area is considered potential habitat. Alternatives R and T-3 would affect 2.10 acres and 0.45 acre of habitat, respectively.

Alternatives C, T, S, and T-3 would remove one to two patches of copper moss that are along the highway and the temporary detour. Alternatives R and S-2 would completely avoid the moss. The No-build Alternative would not affect any patches of copper moss during its lifespan or upon its removal from the environment.

Alternatives C, T, S, and S-2 would completely avoid the known habitat of smallflower monkeyflower. The No-build Alternative would not affect any of this plant's habitat during its lifespan or upon its removal from the environment. Alternatives R and T-3 could potentially affect 1.05 acres and 0.25 acre respectively of smallflower monkeyflower habitat.

Animal Species

The build alternatives would construct new bridges within, and remove the temporary bridges from, the active river channel. The No-build Alternative would leave the temporary bridges in place, within the active river channel, for a period of approximately five to 10 years, until they were either removed or washed away in a flood event. Construction activities such as the creation of small de-watered areas used for the placement or removal of bridge columns may temporarily and indirectly affect hardhead fish as the soil is stirred up and creates cloudiness within the river.

All the build alternatives would remove potential bat foraging and roosting habitat. The No-build Alternative would not affect potential bat habitat during this alternative's lifespan or upon the removal of the temporary bridges.

Alternatives C, T, S, S-2, and the No-build would completely avoid impacts to limestone salamander habitat, respectively. Alternatives R and T-3 would remove 2.10 acres and 0.45 acre of limestone salamander habitat, respectively, resulting in the likely take of the animal itself. The limestone salamander is designated as fully protected through Section 5050 of the California Fish and Game Code, which means a take of this species cannot be authorized through the Fish and Game Code Section 2081 permitting process and implementation of mitigation measures. Since an incidental take of this species is not permitted by the California Department of Fish and Game, there are no mitigation measures available to minimize the take of this species.

Natural Communities

Alternative C would remove 3.3 acres of oak woodland, Alternative T would remove 0.4 acre, Alternative S would remove 0.9 acre, Alternative S-2 would remove 1.7 acres, Alternative R would remove 2.1 acres, and Alternative T-3 would remove 0.45 acre. The No-build Alternative would not affect oak woodland during its lifespan or upon its removal.

Waters of the U.S.

Alternative C would remove 0.06 acre of waters of the U.S., Alternative T would remove 0.06 acre, and Alternative S would remove 0.05 acre. Alternatives S-2, R, and T-3 would not affect waters of the U.S. The No-build Alternative would not affect waters of the U.S. during its lifespan or upon its removal.

Alternative C would remove 0.5 acre of riparian habitat, Alternative T would remove 0.5 acre, Alternative S would remove 0.8 acre, and Alternative S-2 would remove 1.5

acres. Alternatives R and T-3 would not affect riparian habitat. The No-build Alternative would not affect riparian habitat during its lifespan or upon its removal.

Section 4(f) Resources

Two Section 4(f) resources have been identified within the project area. Those resources are the Merced River, which is designated as a Wild and Scenic River, and Incline Road. The segment of the Merced River that flows through the project area is classified as recreational, the least restrictive of the three classifications attributed to segments of Wild and Scenic Rivers, because of the presence of the highway and Incline Road, which provides access to the recreational activities on the river. Incline Road is used for hiking, biking, and riding horses. The proposed build alternatives, as well as the No-build Alternative, directly affect the Merced River and Incline Road because they are entirely encompassed within the 4(f) property boundary. Alternative S2-V2 proposes the *least avoidable harm* to the Merced River and Incline Road. Least avoidable harm is a term used to describe the alternative that poses the smallest amount of harm to a 4(f) resource, without avoiding it entirely. Along with proper implementation of the proposed minimization measures, Alternative S2-V2 would present the least harm to the 4(f) property and all of its values.

Beneficial Impacts

The proposed build alternatives would restore full access to State Route 140—that is, access for all vehicle types traveling within Mariposa County with some length restrictions, equivalent to the access provided on the highway before the slide occurred. The restoration of the roadway would maintain:

- the “all weather” route to Yosemite National Park
- access for emergency vehicles
- access to all types of recreational activities
- access for local commuters, school buses, and goods and services vehicles
- bicycle and pedestrian facilities within the project area

The No-build Alternative would not have a beneficial impact on the human environment because the temporary bridges would eventually fail and have to be removed, closing the highway to through traffic at the section damaged by the rockslide.

Temporary Construction Impacts

The proposed build alternatives range from constructing State Route 140 on a new alignment and bypassing the rockslide, to tunneling around or through the rockslide using the existing highway. Impacts from the construction of the build alternatives would be temporary and would require minimal closures of the highway as traffic would be maintained throughout construction on the temporary detour. Construction activities such as excavation and falsework construction would occur within the river channel. Blasting and drilling activities would be used to construct the tunnels, and excess rock material would need to be hauled off to a disposal site approximately 20 miles from the project site. The trucks would generate dust and impact traffic operations.

Summary of Major Potential Impacts from Alternatives

Potential Impact	Alternative C	Alternative T	Alternative S	Alternative S-2	Alternative R	Alternative T-3	No-build Alternative
Reopen and Restore Full Access	Yes	Yes	Yes	Yes	Yes	Yes	No
Consistent with the Mariposa County General Plan	Yes	Yes	Yes	Yes	Yes	Yes	No – detour bridges would eventually fail, requiring closure of the highway at the section damaged by the rockslide.
Wild and Scenic Rivers	Would be constructed within two-year flood flow of the river (a level known as Q2, which has a 50% chance of being exceeded in any given year) Sediment would create short-term water quality impacts Would remove 320,000 cubic yards of rock material Would construct bridge pier in the flow of whitewater rafting	Would be constructed within Q2 flow of river Sediment would create short-term water quality impacts Would remove 70,000 cubic yards of rock material Would construct bridge pier in the flow of whitewater rafting	Would be constructed within Q2 flow of river Sediment would create short-term water quality impacts Would cut 358-foot-long by 30-foot-wide section of northern slope for placement of viaduct and remove 8,300 cubic yards of rock material Would construct bridge pier in the flow of whitewater rafting	Sediment would create short-term water quality impacts S2-V1: Would cut 510-foot-long by 30-foot-wide-section of northern slope for placement of tied-arch viaduct and remove 21,000 cubic yards of rock material. S2-V2: Would cut 65-foot-long by 30-foot-wide section of northern slope for placement of viaduct and remove 126 cubic yards of rock material.	Would remove between 1.05 and 2.10 acres of habitat for smallflower monkeyflower Mariposa clarkia, and Tompkins sedge Would remove the talus (80,000 cubic yards) of the rockslide Would remove a total of 2.10 acres of limestone salamander habitat, including impacts from construction	Would remove between 0.25 and 0.45 acre of habitat for smallflower monkeyflower, Mariposa clarkia, and Tompkins sedge Would remove 292,000 cubic yards of rock material Would remove a total of 0.45 acre of limestone salamander habitat, including impacts from construction	Temporary bridges would impede whitewater rafting when the Q2 river flow is exceeded Temporarily eliminates Incline Road as a recreational trail
Parks and Recreation	Construction activities would temporarily affect Incline Road Would restore full access to Yosemite and other recreational activities within Mariposa County via State Route 140	Construction activities would temporarily affect Incline Road Would restore full access to Yosemite and other recreational activities within Mariposa County via State Route 140	Construction activities would temporarily affect Incline Road Would restore full access to Yosemite and other recreational activities within Mariposa County via State Route 140	Construction activities would temporarily affect Incline Road Would restore full access to Yosemite and other recreational activities within Mariposa County via State Route 140	Would restore full access to Yosemite and other recreational activities within Mariposa County via State Route 140	Would restore full access to Yosemite and other recreational activities within Mariposa County via State Route 140	The unavoidable failure of the bridges would eventually close the highway at the section damaged by the rockslide Temporarily eliminates Incline Road as a recreational trail Does not provide full access to Yosemite and other recreational activities via State Route 140
Community Character and Cohesion	Would restore full access between the communities along State Route 140	Would restore full access between the communities along State Route 140	Would restore full access between the communities along State Route 140	Would restore full access between the communities along State Route 140	Would restore full access between the communities along State Route 140	Would restore full access between the communities along State Route 140	Access between the communities along State Route 140 would eventually be eliminated when temporary detour bridges fail
Utilities/Emergency Services	Would restore full access for emergency vehicles. No utility relocations required.	Would restore full access for emergency vehicles. No utility relocations required.	Would restore full access for emergency vehicles. No utility relocations required.	Would restore full access for emergency vehicles. No utility relocations required.	Would restore full access for emergency vehicles. No utility relocations required.	Would restore full access for emergency vehicles. No utility relocations required.	Access for emergency vehicles would be eliminated when the detour bridges eventually fail

Potential Impact	Alternative C	Alternative T	Alternative S	Alternative S-2	Alternative R	Alternative T-3	No-build Alternative
Traffic and Transportation/ Pedestrian and Bicycle Facilities	Construction activities would cause short-term closures of the highway and traffic delays Incline Road would be restored to accommodate bicycles and pedestrians The new roadway would include shoulders to accommodate bicycles	Construction activities would cause short-term closures of the highway and traffic delays Incline Road would be restored to accommodate bicycles and pedestrians The new roadway would include shoulders to accommodate bicycles	Construction activities would cause short-term closures of the highway and traffic delays Incline Road would be restored to accommodate bicycles and pedestrians The new roadway would include shoulders to accommodate bicycles	Construction activities would cause short-term closures of the highway and traffic delays Incline Road would be restored to accommodate bicycles and pedestrians The new roadway would include shoulders to accommodate bicycles	Incline Road would be restored to accommodate bicycles and pedestrians The new roadway would include shoulders to accommodate bicycles	Incline Road would be restored to accommodate bicycles and pedestrians The new roadway would include shoulders to accommodate bicycles	Temporarily restricts access for pedestrians and bicycles between communities
Visual/Aesthetics	Structures would retain the overall moderately high visual quality of the area	Structures would retain the overall moderately high visual quality of the area	Structures would produce an average reduction in visual quality to moderate	S2-V1: Structures would retain the overall moderately high visual quality of the area. S2-V2: Structures would improve the overall visual quality of the area to high.	Structures would produce an average reduction in visual quality to moderately low	Structures would improve the overall visual quality of the area to high	Structures provide a short-term visual quality of moderately high. Upon removal of the temporary structures, the landscape would be restored to its naturally high visual quality
Cultural Resources	Avoids altering any significant qualities of the already compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places. Avoids the bedrock mortar site.	Avoids altering any significant qualities of the already compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places. Avoids the bedrock mortar site.	Avoids altering any significant qualities of the already compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places. Avoids the bedrock mortar site.	Avoids altering any significant qualities of the already compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places. Avoids the bedrock mortar site.	Avoids altering any significant qualities of the already compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places. Avoids the bedrock mortar site.	Avoids altering any significant qualities of the already compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places. Avoids the bedrock mortar site.	Short-term altering of the already compromised Yosemite Valley Railroad grade. Upon the removal of the detour, the railroad grade would be returned to its previous state. Avoids the bedrock mortar site.
Hydrology and Floodplain	Would encroach minimally on floodplain	Would encroach minimally on floodplain	Would encroach minimally on floodplain	Would encroach minimally on floodplain	Would encroach longitudinally on the floodplain	Would not encroach on the floodplain	Encroaches on the floodplain. Structures would be affected by 20-year flood event.
Water Quality and Storm Water Runoff	Construction activities would cause short-term impacts to surface water. Storm water runoff could create long-term impacts to surface water.	Construction activities would cause short-term impacts to surface water. Storm water runoff could create long-term impacts to surface water.	Construction activities would cause short-term impacts to surface water. Storm water runoff could create long-term impacts to surface water.	Construction activities would cause short-term impacts to surface water. Storm water runoff could create long-term impacts to surface water.	Construction activities would cause short-term impacts to surface water. Storm water runoff could create long-term impacts to surface water.	Construction activities would cause short-term impacts to surface water. Storm water runoff could create long-term impacts to surface water.	Storm water runoff could create long-term impacts to surface water.
Geology/Soils/Seismic/Topography	Would remove 320,000 cubic yards of rock material with a disposal cost of \$17.6 million. Rock removal would create the potential for minor rockfalls in cut areas.	Would remove 70,000 cubic yards of rock material with a disposal cost of \$6.1 million. Rock removal would create the potential for minor rockfalls in cut areas.	Would cut 358-foot-long by 30-foot-wide section of northern slope for placement of viaduct and remove 8,300 cubic yards of rock material with a disposal cost of \$457,000. Rock removal would create the potential for minor rockfalls in cut areas.	Would remove 21,000 cubic yards of rock material with a disposal cost of \$1.2 million for S2-V1. S2-V2 would remove 126 cubic yards with a disposal cost of \$6,900. Rock removal would create the potential for minor rockfalls.	Would remove the talus of the rockslide, requiring the disposal of 80,000 cubic yards of rock material with a disposal cost of \$4.4 million. The removal could create the potential for exposure to future slides, minor rockfalls, and safety risk during construction.	Would remove 292,000 cubic yards of rock material with a disposal cost of \$24.6 million. Rock removal would create the potential for future slides and minor rockfalls in cut areas.	None
Hazardous Waste/Materials	Potential exposure to elevated levels of arsenic from Incline Road.	Potential exposure to elevated levels of arsenic from Incline Road.	Potential exposure to elevated levels of arsenic from Incline Road.	Potential exposure to elevated levels of arsenic from Incline Road.	Potential exposure to elevated levels of arsenic from Incline Road.	Potential exposure to elevated levels of arsenic from Incline Road.	Potential exposure to elevated levels of arsenic from Incline Road.

Summary

Potential Impact	Alternative C	Alternative T	Alternative S	Alternative S-2	Alternative R	Alternative T-3	No-build Alternative
Natural Communities	3.3 acres of oak woodland would be removed	0.4 acre of oak woodland would be removed	0.9 acre of oak woodland would be removed	1.7 acres of oak woodland would be removed	2.10 acres of oak woodland would be removed.	0.45 acre of oak woodland would be removed.	None
Wetlands and other Waters	0.06 acre of waters of the United States would be affected. 0.5 acre of riparian habitat would be removed.	0.06 acre of waters of the United States would be affected. 0.5 acre of riparian habitat would be removed.	0.05 acre of waters of the United States would be affected. 0.8 acre of riparian habitat would be removed.	1.5 acres of riparian habitat would be removed.	None	None	None
Plant Species	Two patches of copper moss would be removed.	Two patches of copper moss would be removed.	One patch of copper moss would be removed.	None	2.1 acres of Mariposa clarkia and Tompkins sedge habitat would be removed. 1.05 acres of smallflower monkeyflower habitat would be removed.	0.45 acre of Mariposa clarkia and Tompkins sedge habitat would be removed 0.25 acres of smallflower monkeyflower habitat would be removed One patch of copper moss would be removed	None
Animal Species	Temporary decrease in water quality would indirectly affect hardhead fish 3.3 acres of bat habitat would be affected.	Temporary decrease in water quality would indirectly affect hardhead fish 0.4 acre of bat habitat would be affected.	Temporary decrease in water quality would indirectly affect hardhead fish 0.9 acre of bat habitat would be affected.	1.7 acres of bat habitat would be affected	More than 2 acres of bat habitat would be affected, 1.05 acres west of the rockslide and 1.05 acres east of the rockslide	About 0.45 acre of bat habitat would be affected, 0.2 acre west of the rockslide and 0.25 acre east of the rockslide	None
Threatened and Endangered Species	Ground disturbance would affect habitat of the ringtail	Ground disturbance would affect habitat of the ringtail	Ground disturbance would affect habitat of the ringtail	Ground disturbance would affect habitat of the ringtail	Ground disturbance would affect habitat of the ringtail Would cut into the slope on the south side of the river, potential habitat for Merced clarkia and limestone salamander, affecting 2.1 acres of these habitats	Ground disturbance would affect habitat of the ringtail Would cut into the slope on the south side of the river, potential habitat for Merced clarkia and limestone salamander, affecting 0.45 acre of these habitats	None
Invasive Species	Disturbance of ground would cause dispersal of non-native weeds.	Disturbance of ground would cause dispersal of non-native weeds.	Disturbance of ground would cause dispersal of non-native weeds.	Disturbance of ground would cause dispersal of non-native weeds.	Disturbance of ground would cause dispersal of non-native weeds.	Disturbance of ground would cause dispersal of non-native weeds.	None
Cost	\$53.5 million	\$80.3 million	\$34.6 million	S2-V1: \$93.9 million S2-V2: \$38.3 million	\$78.9 million	\$179.2 million	N/A
Length of Construction	3 years	5 years	3 years	3 years	5 years	5 years	N/A

Coordination with the Public and Other Agencies

The following permits, reviews, and approvals would be required for project construction:

Permits and Approvals Needed

Agency	Permit/Approval	Status
U.S. Forest Service	Biological Evaluation	Submittal anticipated prior to the finalization of the environmental document
U.S. Forest Service	Letter of Consent for the issuance of a Department of Transportation easement	Anticipated prior to construction
U.S. Department of Transportation	Department of Transportation Easement	Anticipated prior to construction
U.S. Forest Service	Section 7(a) Wild and Scenic Rivers Act Evaluation	Evaluation anticipated following the selection of a preferred alternative
California Department of Fish and Game	1602 Streambed Alteration Agreement	Submittal anticipated prior to construction
California Department of Fish and Game	Section 2081 Permit for the potential removal of Merced clarkia during construction	Submittal anticipated prior to construction
California Regional Water Quality Control Board	Section 401 Certification for a Water Discharge Permit	Submittal anticipated prior to construction
U.S. Army Corps of Engineers	Section 404 Nationwide Permit 14 for filling or dredging waters of the United States	Submittal anticipated prior to construction
State Historic Preservation Officer	Determinations of Eligibility for Cultural Resources	Concurrence Letter received October 10, 2007 See Appendix D

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List of Abbreviated Terms

Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
FHWA	Federal Highway Administration
NEPA	National Environmental Policy Act
PM	post mile
EIR	Environmental Impact Report
EIS	Environmental Impact Statement

Chapter 1 Purpose and Need for the Project

1.1 Introduction

The California Department of Transportation (Caltrans) is the lead agency under the National Environmental Policy Act. Caltrans is the lead agency under California Environmental Quality Act.

Caltrans proposes to restore full highway access between the communities of Mariposa and El Portal via State Route 140 in Mariposa County, by repairing or permanently bypassing the portion of the highway that was damaged by the Ferguson rockslide. The total length of the project is 0.7 mile.

The land in the project area is primarily steeply rolling hills supporting a mixed oak woodland forest. This forest is made up of oak trees and pine trees ranging from seedlings to adult trees. The ground is a mixture of low broadleaf evergreen shrubs and grasses. Rock outcroppings are common. The existing highway, Incline Road grade, and the electric transmission lines are the primary human-made elements in the project area. The roadway and associated cut slopes parallel the Merced River. The segment of the Merced River that flows through the project area is classified as recreational, the least restrictive of the three classifications attributed to segments of Wild and Scenic Rivers, because of the presence of the highway and Incline Road, which provide access to the recreational activities on the river.

Communities in the affected area include Mariposa, Midpines, and Briceburg on the western side of the rockslide and Yosemite Village and El Portal on the east side of the rockslide. Mariposa is the largest town in the county and supports the county's greatest amount of tourist accommodations. El Portal is a high-density residential area with a business and resort center near the entrance to Yosemite National Park. There are no residences or businesses within the limits of the proposed project. Within the limits of the proposed project and prior to the Ferguson rockslide, State Route 140 was a two-lane, undivided highway. Following the rockslide and the completion of a temporary detour, the current State Route 140 bridges the Merced River bypassing the rockslide as a one-lane road. This bypass route provides for one-way traffic that is controlled by signalized lights.

The first rockslides in the area began on April 29, 2006. Since April 2006, rockslides have damaged and blocked a substantial portion of State Route 140 between Mariposa and El Portal. The Ferguson rockslide closed State Route 140 to traffic from 8 miles east of Briceburg to 7.6 miles west of El Portal.

In April 2006, following the rockslide, a State of Emergency was declared in Mariposa County and Caltrans was directed to request federal assistance to reopen State Route 140. On June 17, 2006, Caltrans received approval to proceed with the construction of a temporary detour. On August 10, 2006, the Federal Highway Administration accepted the State of Emergency and approved the use of a Categorical Exclusion under NEPA to permit Caltrans to construct temporary bridges over the Merced River and a temporary single-lane detour along Incline Road.

In August 2006, Caltrans completed the construction of the temporary detour that bypassed the rockslide and, on August 18, reopened State Route 140 to vehicles fewer than 28 feet long. The temporary detour consisted of two single-lane bridges that crossed the Merced River upstream and downstream of the rockslide and connected to a single-lane paved section of Incline Road directly across the river from the rockslide. Traffic was controlled on this single-lane detour by signals that allowed the passage of one-way traffic. Highway travelers experienced up to a 15-minute delay getting through the detour. The closure of State Route 140 and the restricted vehicle length on the temporary detour created hardships for residents and businesses in the area, as well as prevented tour buses and deterred many recreational travelers from using State Route 140 to enter Yosemite National Park.

At the same time the temporary detour was opened, Caltrans began work on a permanent solution to restore State Route 140. On September 26, 2006, the Federal Highway Administration approved \$2 million to perform preliminary engineering for the development of permanent restoration work. Various alternatives were developed and studied and then circulated to the public through an Initial Study/Environmental Assessment. Comments that were received from the public and regulatory agencies indicated the project could significantly affect the Wild and Scenic Merced River. Caltrans concluded that an Environmental Impact Report/Environmental Impact Statement would be necessary to evaluate a greater range of alternatives and their effect on the river, extending the environmental documentation process beyond what had been originally expected.

Mariposa County had already seen a drop in tourism-generated revenue, mostly due to the vehicle length restriction on the temporary detour, which prevented many tour buses and recreational vehicles from traveling to Yosemite on State Route 140. Because the decision to prepare an Environmental Impact Report/Environmental Impact Statement further delayed a permanent solution, Caltrans, regulatory agencies, and Mariposa County officials began working on another temporary solution that would accommodate vehicles of greater lengths while the permanent project would be developed. On April 23, 2008, Caltrans approved the use of a Categorical Exemption under CEQA and a Categorical Exclusion under NEPA to permit the construction of the new temporary bridges over the Merced River. The Federal Highway Administration's responsibility for environmental review, consultation, and any other action required in accordance with applicable federal laws for the construction of the new temporary bridges in 2008 was carried out by Caltrans under its assumption of responsibility pursuant to Chapter 3 of Title 23, United States Code, Section 326 and a Section 6004 Memorandum of Understanding executed between the Federal Highway Administration and Caltrans.

The new, longer-term, temporary solution involved the construction of two temporary bridges across the Merced River on a skewed alignment adjacent to the existing temporary bridges. These bridges would serve as the new temporary State Route 140 detour and the first set of temporary bridges would be removed. The skewed alignment of the new temporary bridges would allow for a larger turning radius that could accommodate vehicles up to 45 feet long, providing for essential traffic. Traffic would be controlled on this new single-lane detour by signals. The project was completed in June 2008.

State Route 140 is the preferred route for entering Yosemite National Park for many travelers since other highways, such as Routes 41 and 120, are more difficult to maneuver and subject to harsh weather during winter months. Communities along State Route 140 have established businesses that rely on travelers through the area for some or most of their sales. Restoring State Route 140 would give residents and recreational travelers full access to the communities and towns within Mariposa County, including their commercial businesses, and recreational destinations such as Yosemite National Park. Figures 1-1 and 1-2 show the project vicinity and location maps.

The current project is funded in the State Highway Operation and Protection Plan for fiscal year 2011/2012 under the Major Damage Permanent Restoration Program

(201.131). The project has been approved for emergency relief assistance as part of a declared disaster under Damage Assessment Form number JMD-CT10-001-0, approved by the Federal Highway Administration on September 26, 2006. A supplemental Damage Assessment Form number JMD-CT10-001-1 was approved on April 24, 2008 to support modifications to the temporary detour, and a revised Damage Assessment Form would be prepared for the construction and support costs on the permanent restoration project when a preferred alternative is selected.

1.2 Purpose and Need

1.2.1 Purpose

The purpose of the project is to restore full highway access between Mariposa and El Portal via State Route 140.

1.2.2 Need

Currently, motorists must use a temporary, one-lane detour route to bypass the section of State Route 140 that was blocked and damaged by the Ferguson rockslide. Restoration of State Route 140 would provide full access to all traffic using State Route 140 between the town of Mariposa and Yosemite National Park. Full highway access for this portion of State Route 140 would accommodate all types of vehicles with some length restrictions, equivalent to the restrictions that were in place before the slide occurred. The detour was designed to be a temporary solution, which restricted its use to essential traffic rather than a full access route with some restrictions as it was prior to the rockslide. Caltrans entered into an agreement with the U.S. Forest Service that the structures used for the detour would be removed once a permanent solution could be constructed.

When the highway was initially closed, an estimated 2.5 hours were added to a one-way trip between Mariposa and Yosemite or El Portal. Mariposa residents working in Yosemite Valley, for example, saw their commutes become as much as 90 miles longer each way. Motorists who would have used State Route 140 had to travel on either State Route 41 or 120, routes that are harder to maneuver with larger vehicles. These alternate routes require motorists to drive longer distances and to do so in harsh weather conditions during winter months. When the temporary detour opened, travel time for those vehicles that could fit decreased substantially, but motorists could still expect delays up to 15 minutes (as posted on a Caltrans traffic sign) in either direction by a stoplight that controls one-way traffic on the single-lane detour.

With the new temporary bridges, vehicles up to 45 feet long were once again able to use the highway. However, the structures supporting the temporary bridges have a predicted lifespan of about 10 years and will ultimately require removal whether a permanent solution has been provided or not. Should the structures reach the end of their useful life before a permanent solution is in place, their necessary removal would lead to the closure of State Route 140 at the section damaged by the rockslide. The temporary bridges are located within the 20-year flood zone and are not expected to withstand flood levels similar to those that the area has seen in years past.

As the temporary closure of the highway in 2006 proved, a permanent closure of State Route 140 would negatively affect Mariposa County and Yosemite National Park. Such a closure would make the delivery of goods and services, as well as the arrival and departure of tourists, more difficult and time-consuming. Local residents who live on one side of the slide area and work on the other side would experience much longer and more dangerous commutes. State Route 140 is essential in supporting the Mariposa County and Yosemite communities.

The Ferguson rockslide created a debris field that is 650 feet wide by 800 feet long. Underneath that debris field lies a section of State Route 140, damaged and covered by rock. The rockslide also encroached nearly 30 feet into the Merced River. State Route 140 outside the current project area has suffered rockslide damage in the past. Since 1999, approximately \$13 million has been spent on rockslide removal, slope stabilization, rockfall barriers, and now, the construction of the temporary detours, all within the project area. The permanent restoration of State Route 140 would maintain full access for all types of travelers, ranging from recreational to business, and eliminate future repair costs caused by a repeat of the Ferguson rockslide.

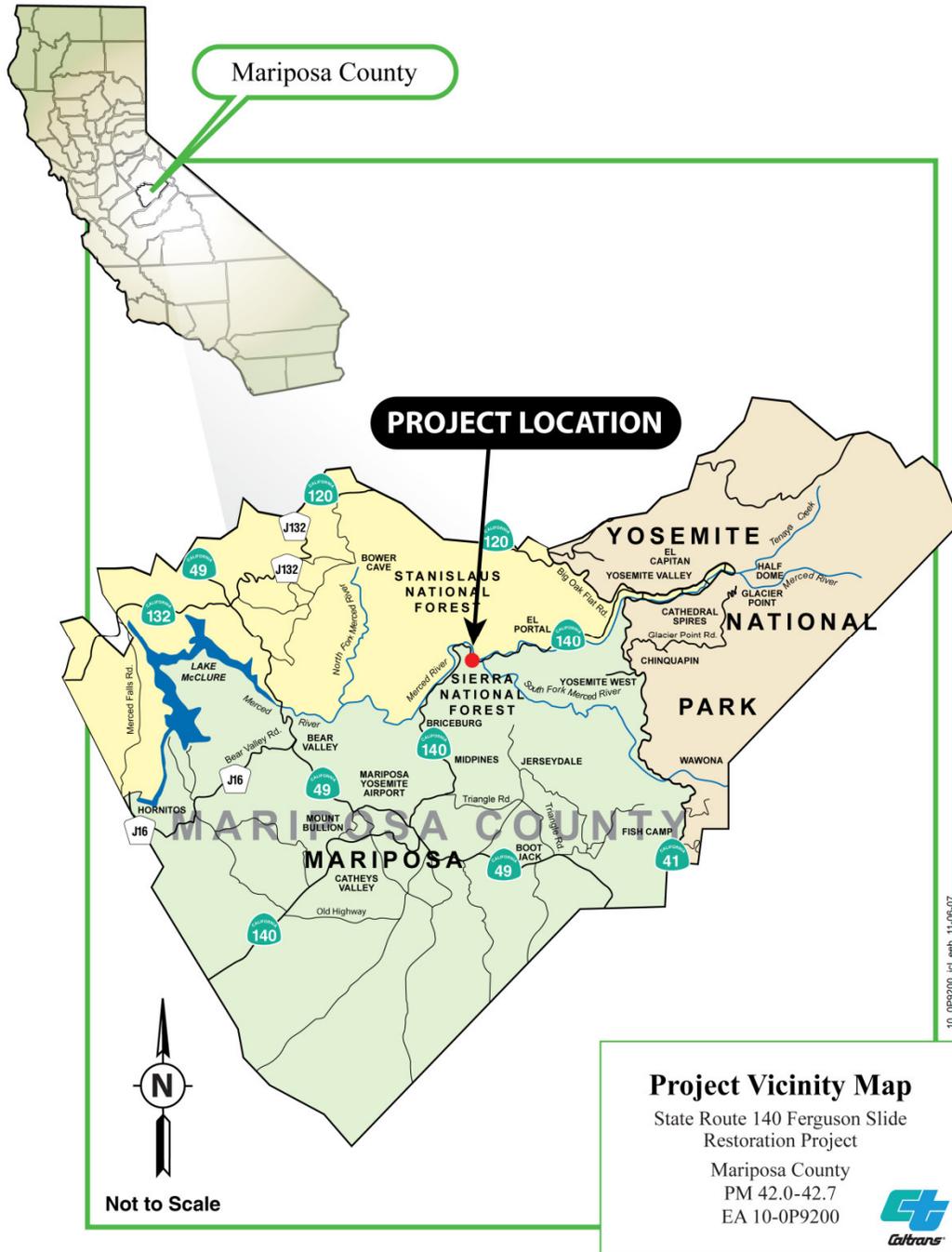


Figure 1-1 Project Vicinity Map

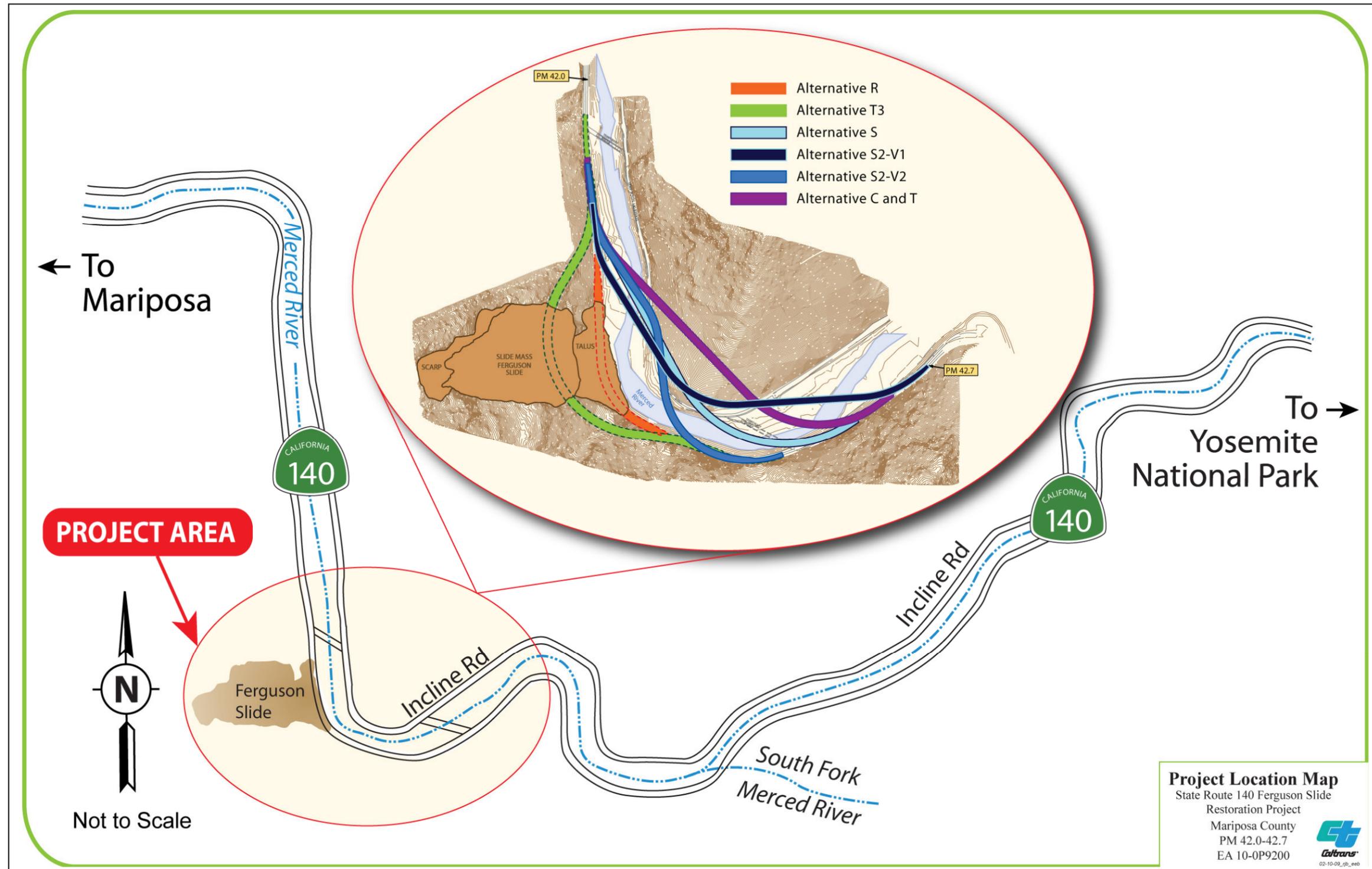


Figure 1-2 Project Location Map

Chapter 2 Project Alternatives

2.1 Alternatives

Caltrans proposes to restore full highway access between the communities of Mariposa and El Portal via State Route 140 in Mariposa County, by repairing or permanently bypassing the portion of the highway that was damaged by the Ferguson rockslide. Restoration of State Route 140 would eliminate the detour and provide full access to all traffic on State Route 140 between the town of Mariposa and Yosemite National Park. This section describes the proposed action and the design alternatives that were developed by an inter-disciplinary team to achieve the project purpose and need while avoiding or minimizing environmental impacts. The alternatives are Alternative C (Open-cut Realignment), Alternative T (Tunnel Realignment), Alternative T-3 (Tunnel under Slide Realignment), Alternative S (Viaduct Realignment), Alternative S-2 (Modified S Realignment), Alternative R (Rockshed/Tunnel), and the No-build Alternative.

2.1.1 Build Alternatives

Caltrans created a project development team to identify alternative solutions. Alternative solutions created by the project development team were based on cost, schedules, environmental effects, engineering considerations, constructability, and project mitigation. In November 2007, Caltrans circulated an Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment, which originally proposed Alternatives C, T, and S as the build alternatives. Public and agency comments on that document indicated that the proposed alternatives may have a significant impact on the Merced River, which is designated a Wild and Scenic River. Commenters suggested that additional alternatives should be developed and studied through the Environmental Impact Report/Environmental Impact Study process.

In January 2008, Caltrans issued a Notice of Intent and Notice of Preparation advertising the preparation of an Environmental Impact Report/Environmental Impact Study. The additional alternatives developed and analyzed within this document were Alternative S-2 (Modified S Realignment), Alternative T-3 (Tunnel under Slide Realignment), and Alternative A (At-grade Realignment). The project development team ensures that state and federal requirements are followed to meet state design standards and to minimize environmental impacts and cost. The following alternatives propose to fully reopen State Route 140 on the existing alignment, or by

realigning the highway either north of the Merced River, bypassing the rockslide, or south of the Merced River through a tunnel. The roadbeds of all the proposed alternatives would include two 12-foot-wide lanes with 8-foot-wide shoulders. The tunnel alternatives would also include 4-foot-wide safety walkways.

Common Design Features of the Build Alternatives

Once construction is complete for any of the build alternatives, the temporary detour must be removed. All temporary bridges, including the pilings, piers, abutments, and pedestals to at least one foot below the ground, would be removed. The embankments behind the abutments would be removed, and the slopes would be restored to their original contours.

Six culvert systems would be included in the design of the build alternatives to channel storm water runoff away from the river. The beginning, middle, and the end of the project would each receive two culverts connected to drains that would deliver runoff to roadside ditches.

At the request of the National Park Service, all of the build alternatives would restore Incline Road back to its natural unpaved condition for pedestrians and bicyclists or other recreational users.

None of the alternatives require utility relocations.

Unique Features of Build Alternatives

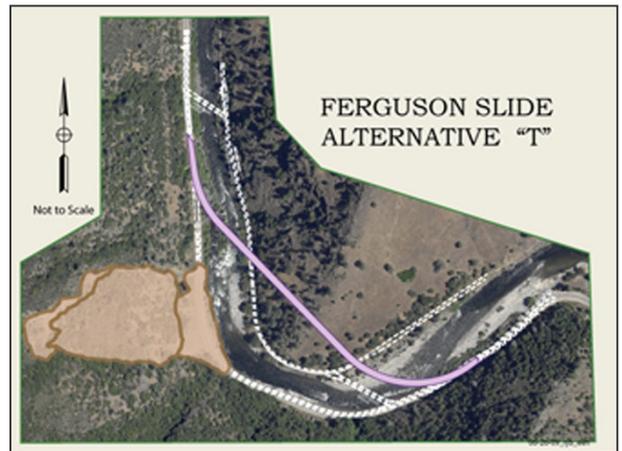
Alternative C (Open-cut Realignment)

- Realigns highway to the northeast, crossing the Merced River
- Includes two concrete bridges – 550 feet and 650 feet long
- Adds a terrace between the highway and the cut slopes to catch falling rock
- Cost: \$53 million in 2009 dollars



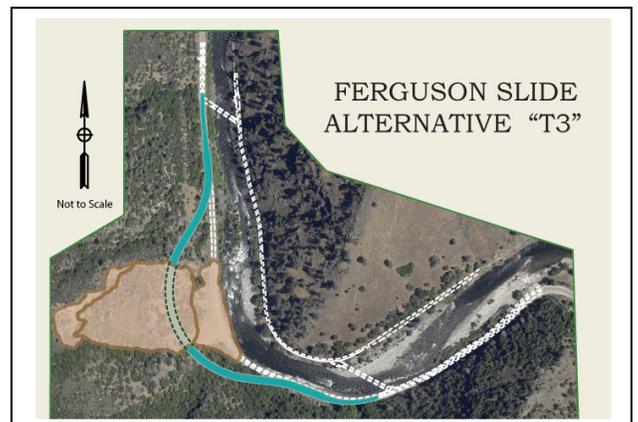
Alternative T (Tunnel Realignment)

- Realigns highway to the northeast, crossing the Merced River
- Includes two concrete bridges – 550 feet and 650 feet long
- Carries the highway through a 700-foot-long tunnel in the mountain on the north side of the river
- Includes two emergency walkways in the tunnel
- Cost: \$79.8 million in 2009 dollars



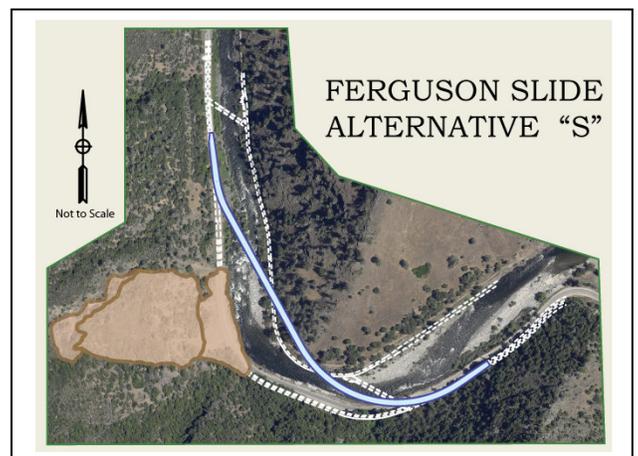
Alternative T-3 (Tunnel under Slide Realignment)

- Realigns highway through a 2,200-foot-long tunnel built beneath the slide debris field
- Keeps State Route 140 on the south side of the Merced River
- Includes two emergency walkways in the tunnel
- Cost: \$178.8 million in 2009 dollars



Alternative S (Viaduct Realignment)

- Realigns highway to the northeast, crossing the Merced River
- Includes two concrete bridges – 805 feet and 725 feet long
- Carries the highway along a 358-foot-long viaduct supported by a retaining wall on the north side of the river
- Adds a 10-foot-wide rockfall area between the cut slope and the highway
- Cost: \$33.7 million in 2009 dollars



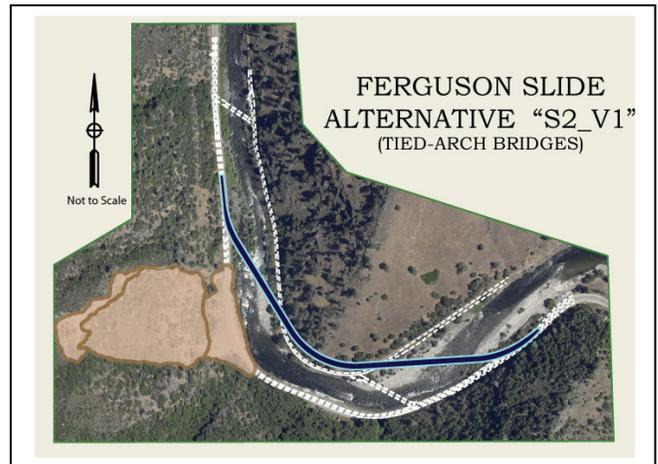
Alternative S-2 (Modified Viaduct Realignment)

This alternative differs from Alternative S in that it proposes two different bridge variations along with their own specific roadway alignments. Regardless of variation, this alternative would:

- Realign highway to the northeast, crossing the Merced River
- Carry the highway along a viaduct supported by a retaining wall on the north side of the river

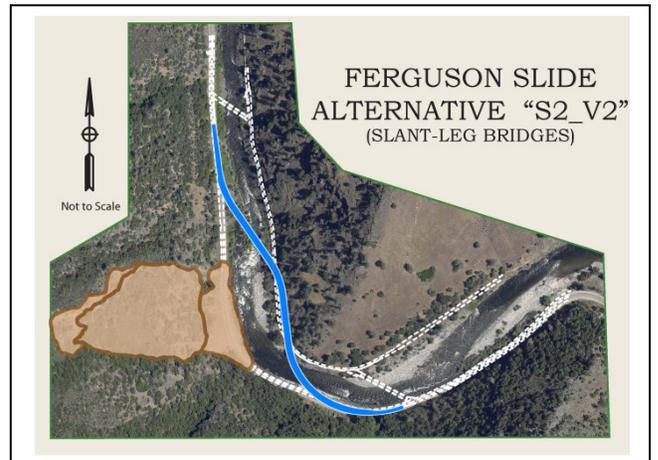
Variation S2-V1

- Includes two tied-arch bridges – 700 feet and 790 feet long
- Carries the highway along a 510-foot-long viaduct supported by a retaining wall on the north side of the river
- Includes a 10-foot-wide rockfall area between the cut slope and the highway
- Cost: \$92.2 million in 2009 dollars



Variation S2-V2

- Includes two slant-leg bridges (also called V-bent) – 860 feet and 700 feet long
- Carries the highway along a 65-foot-long viaduct supported by a retaining wall on the north side of the river
- Includes a 10-foot-wide rockfall area between the cut slope and the highway
- Cost: \$37.9 million in 2009 dollars



Alternative R (Rockshed/Tunnel)

- Aligns highway through a 760-foot-long cut-and-cover rockshed (a reinforced concrete box supported on 20-foot-long concrete piles) built through the talus (foundation level of debris) of the rock slide
- Uses the existing State Route 140 alignment and keeps the highway on the south side of the Merced River
- Includes an emergency walkway 4 feet wide in the tunnel
- Cost: \$78.5 million in 2009 dollars



Additional Unique Features of the Build Alternatives

Alternative C

- Includes 22-foot-wide terraces on both sides of the highway between the cut slopes to catch falling rock material
- Requires transport of 320,000 cubic yards of rock material to a disposal site 20 miles from the project area

Alternative T

- Requires transport of 70,000 cubic yards of rock material to a disposal site 20 miles from the project area

Alternatives T, T-3, and R

- Calls for construction of a tunnel operations and maintenance facility potentially located at the Midpines Maintenance Station where routine 24-hour supervision of the emergency monitoring and reporting systems can be conducted
- Incurs future operating and maintenance costs of \$1.5 million per year, to include full-time monitoring of the tunnel, routine cleaning and potential painting, and repair and replacement of tunnel equipment, such as electrical systems, structural components, and water drainage systems

Alternatives C, T, S, and S2-V1

- Extends the current one-lane detour along Incline Road and constructs a third temporary bridge upstream of the current detour bridges. This extension and third

bridge would allow traffic to continue to flow through the construction area while the permanent bridges are being built. The temporary detour would be 393 feet longer and 5.5 feet higher to accommodate possible flooding. That portion of Incline Road would also be paved with asphalt concrete to match the existing detour. The third temporary bridge would be constructed using concrete abutments and piers on each side of the river. The newly formed embankment slopes would be protected with the placement of rocks. The temporary signal system would be relocated upstream as well to facilitate the one-lane traffic operation at the newly constructed temporary bridge. S2-V2 would not require the construction of the third temporary bridge.

Alternative S

- Requires transport and disposal of 8,300 cubic yards of rock material at a disposal site located 20 miles from the project area

Alternative S2-V1

- Calls for a bridge height between 110 and 130 feet above the bridge deck
- Requires transport and disposal of 21,000 cubic yards of rock material at a disposal site located 20 miles from the project area

Alternative S2-V2

- Requires transport and disposal of 126 cubic yards of rock material at a disposal site located 20 miles from the project area

Alternatives C, T, S, and S-2 (both variations)

- Requires a mandatory design exception because of limited stopping sight distance at the curved segments of the realigned highway, due to the proposed height of the bridge railing
- Alternative S-2 requires a mandatory design exception for not meeting the minimum turning curve radius for the specified design speed of 40 miles per hour
- Includes design for proposed bridge decks to be 30 feet above Incline Road

Alternative R

- Calls for a mandatory design exception to accommodate constructing the rockshed/tunnel on the existing alignment, which features a roadway curve too sharp to meet current standards

- Requires construction excavation equipment be modified to operate remotely in order to maximize worker safety during construction
- Necessitates installing a rock fence on the slope of the rockslide to protect workers, as much as possible, from falling rock debris
- Depends upon removal of the talus, potentially causing another rockslide. Should this rockslide occur, the newly accumulated rock material would need to be excavated and any damage done to the rockshed/tunnel structure would need to be repaired.
- Requires construction of retaining walls to block rock material from falling onto the highway on the approach ends of the structure where it cuts into the canyon wall.
- Requires transport of 80,000 cubic yards of rock material to a disposal site located 20 miles from the project area

Alternative T-3

- Requires transport and disposal of 292,000 cubic yards of rock material at a disposal site located 20 miles from the project area
- Requires construction of retaining walls to block rock material from falling onto the highway on the approach ends of the structure where it cuts into the canyon wall

2.1.2 No-build Alternative

Consideration of a No-build Alternative is required by the National Environmental Policy Act and the California Environmental Quality Act. The No-build Alternative would leave State Route 140 damaged and blocked by the Ferguson rockslide, and it would leave the temporary bridges in place. As a result of the No-build Alternative, the temporary detour would continue to function as State Route 140. The traffic signals controlling the single-lane access through the detour would remain in operation.

The detour was constructed during a declared emergency as a temporary solution to the closure of State Route 140. It was designed under an agreement with the U.S. Forest Service that the pavement and structures used for the detour would be removed once a permanent solution could be constructed. The No-build Alternative requires the same environmental analysis as the proposed permanent build alternatives.

The temporary bridges and the structures that support them vary as to the length of their service life, depending on environmental conditions. The actual steel bridges

themselves may have a useful life of between 20 and 25 years. This estimate is based on normal wear, fatigue, and corrosion of the steel components. However, the actual service life of the bridges could depend on the flow of the river. The temporary bridges are designed to allow a 10-year flood to pass safely underneath them, but when greater floods, like a 20-year flood occurs, the bridges could become damaged to the point of failure.

The structures supporting the temporary bridges have a service life of 5 to 10 years. These support structures are actually what determine the useful age of the detour route. They consist of bridge abutments made partly of galvanized wire retaining walls. Between the fifth and tenth year of use, the maintenance of these walls will increase and, at the tenth year, the walls will require actual replacement. River flows resulting from a four-year flood could damage the retaining walls and shorten their service life, leading to the closure of the State Route 140 detour.

The temporary nature of the No-build Alternative bridge structures and the fact that they could be overrun with flood waters in the event of a heavy precipitation year leave the area vulnerable to loss of highway access from a sudden failure of the structures. The agreement with the U.S. Forest Service does not allow the reconstruction of the temporary detour bridges. When they fail, which will be within a decade due either to flooding or general wear, State Route 140 will be permanently severed in the absence of a permanent solution. The No-build Alternative does not meet standard design features nor would it meet the purpose and need of the project of restoring the highway to its original operation as a full-access route with some restrictions.

2.1.3 Comparison of Alternatives

Potential environmental effects, cost and the degree to which they meet project purpose and need are used to evaluate the proposed project alternatives. All six of the proposed build alternatives would restore full access between the communities on State Route 140, as well as to Yosemite National Park and other recreational opportunities, and all are consistent with the Mariposa County General Plan, the Sierra National Forest Service Land and Resource Management Plan, and the South Fork and Merced Wild and Scenic River Implementation Plan. Any alternative would meet the requirements of the National Marine Fisheries Service Draft Recovery Plan for the Sacramento River winter-run Chinook salmon and Central Valley spring-run Chinook salmon, which may potentially include the reintroduction of steelhead above the New Exchequer Reservoir on the main stem Merced River and on the South Fork

Merced River. The build alternatives would maintain access through the project area for all types of emergency vehicles whereas the No-build currently provides short-term access for emergency vehicles. Its eventual failure and removal from the environment would cut off emergency access through the area in the long-term. The No-build is inconsistent with the general plan.

The build alternatives as well as the No-build Alternative would not affect cultural resources. The architectural resources within the project area were determined not to be eligible for the National Register of Historic Places. Alternatives C, T, and S2-V1, would maintain the project area visual and aesthetic quality at moderately high. Alternative S would produce an average reduction in visual quality to moderate while Alternative S2-V2 would improve the overall visual quality of the area to high. Alternative T-3 would also improve the area to a high visual quality. Alternative R, which proposes constructing a cut-and-cover tunnel, or rockshed, through the foundation layer of the rock slide and using the existing State Route 140 alignment is predicted to reduce scenic quality in the area to moderately low, a more substantial visual impact than the other build alternatives. The No-build Alternative imposes a short-term visual quality of moderately high with the temporary bridges in place. With the removal of the temporary structures, the surrounding landscape would be restored to its naturally high visual quality.

Construction activities associated with all the build alternatives would cause short-term impacts to surface water quality, while any of them could potentially create long-term surface water impacts through storm water run-off. The temporary structures of the No-build Alternative would only create short-term storm water run-off impacts since the bridges would eventually be removed. Also, any of the build alternatives could result in a similar chance of dispersing non-native weed species in the area should they be constructed. Potential hazardous waste and materials exposures are similar in all of the alternatives in that they present the possibility of exposure to elevated levels of arsenic along Incline Road due to soil disturbance.

All the build alternatives would have some impact on the Merced River, which is designated Wild and Scenic. Also, they would all have some effects on geology, soils and topography in the area, traffic, natural communities, wetland and other waters and plant, animal and endangered or threatened species.

Alternatives C, T and S would all include construction of permanent bridge piers within the two-year flood flow (known as the Q2) of the Merced River. This

construction would negatively affect two different outstandingly remarkable values of the Merced River: the free-flowing nature of the river and its value as a recreational facility, specifically for whitewater rafters who traverse this section of the river. Alternatives R and T-3 would not place structures within the free-flowing boundaries of the river, but they both would impact the outstandingly remarkable value of wildlife in the area by removing a portion of limestone salamander habitat resulting in the likely death of limestone salamanders. Limestone salamander is a fully protected species by the State of California. Alternative R would remove a little more than 2 acres of salamander habitat, while Alternative T-3 would remove a bit less than half an acre. Both alternatives would also remove habitat of the smallflower monkeyflower, the Mariposa clarkia and the Tompkins sedge. Only Alternative S-2 with its two variations would avoid permanently impacting all three of these outstandingly remarkable values. The No-build Alternative would have short-term impacts on the free flow of the river if the water level exceeds the Q2. The temporary structures would eventually be removed from the banks of the river eliminating the impact to the river. The No-build Alternative would not affect the limestone salamander or any of the plant species of concern during its temporary lifespan or upon its removal.

For all these build alternatives, there would be a significant amount of rock removed through cutting, blasting and drilling. Sediment from construction operations could cause short-term impacts to water quality. Alternative C would result in removing 320,000 cubic yards of rock, while Alternative T-3 would remove 292,000 cubic yards, Alternative R would remove 80,000 cubic yards of the rockslide talus, and Alternative T would take about 70,000 cubic yards of material from the site. Alternatives S and S-2 would cut large sections from the northern slope for viaduct placement. Alternative S would result in removing 8,300 cubic yards of rock, while S2-V1 would remove 21,000 cubic yards, and S2-V2 would remove 126 cubic yards. All the build alternatives have the potential to create minor rockfalls in cut areas and Alternatives R and T-3 also offer possible exposure to future slides. As for the No-build Alternative, the removal of the temporary bridges would only restore the geology of the project area back to its natural contours.

Traffic impacts could be expected from four of the build alternatives: C, T, S and S-2 would all result in short-term closures of the highway, as well as traffic delays during construction activities. All of the build alternatives would include restoring Incline Road for use by bicyclists and pedestrians, which is not true of the No-build Alternative. The No-build Alternative would eventually cut off through traffic at the

project site because it will eventually fail and may not be replaced or repaired, which now eliminates the use of Incline Road as a trail. Currently, the temporary detour places short-term impacts on bicyclists and pedestrians since Incline Road is used as a vehicular route with no shoulders.

Three of the build alternatives would affect other waters of the United States. Alternatives C, T and S would all affect 0.06 acre or less of other waters, while S-2, R, T-3, and the No-build would have no such impact. Riparian (riverside) habitat would be removed by four of the alternatives. Alternatives C, T, S and S-2 would all claim some riverside habitat, with S-2 (both variations) claiming the largest swath at 1.5 acres. The other three are all under an acre, with Alternatives C and T calling for the loss of just one-half acre of riparian habitat each. Alternatives R and T-3, along with the No-build, have no impact on riverside habitat.

All of the build alternatives would have impacts on natural communities, although the magnitude of those impacts varies. Alternative C would have the largest effect on oak woodlands, with the removal of 3.3 acres. Alternatives S-2 and R have the next highest impacts, with the removal of around 2 acres each. The other alternatives call for the removal of less than an acre of oak woodland, with Alternatives T and T-3 each coming in at under a half acre. The No-build Alternative would not have an impact.

All but one of the build alternatives would have some effect on special-status plant species habitat, including copper moss, Tompkins sedge, Mariposa clarkia and smallflower monkeyflower. Alternative T-3 would have an impact on all four species, while Alternative S-2 and the No-build would have no effect on any of them. Alternatives C, T and S would affect one to two patches of copper moss each. Alternative R would remove more than an acre of smallflower monkeyflower habitat and slightly more than 2 acres of habitat for Mariposa clarkia and Tompkins sedge.

All of the build alternatives would potentially affect some bat habitat. In addition, because Alternatives C, T and S would cause a temporary decrease in surface water quality, they might impact the hardhead fish. All of the alternatives would potentially impact the habitat of the threatened ringtail, at least temporarily, due to ground disturbance related to construction. In addition, Alternatives R and T-3 would both remove potential habitat for the limestone salamander.

The estimated costs of the alternatives range between \$33.7 million for Alternative S and \$178.8 million for Alternative T-3. Between those extremes, Alternative S2-V2 is

the next least expensive, at about \$37.9 million, while Alternatives T and R fall into the range of \$78-80 million. Alternative C occupies the middle range of about \$53 million. Table 2.1, which begins on page 21, compares the alternatives by comparing their environmental effects, cost and construction time.

Table 2.1 Comparison of Build Alternatives to the No-build Alternative

Potential Impact	Alternative C	Alternative T	Alternative S	Alternative S-2	Alternative R	Alternative T-3	No-build Alternative
Reopen and Restore Full Access	Yes	Yes	Yes	Yes	Yes	Yes	No
Consistent with the Mariposa County General Plan	Yes	Yes	Yes	Yes	Yes	Yes	No – detour bridges would eventually fail, requiring closure of the highway at the section damaged by the rockslide.
Wild and Scenic Rivers	Would be constructed within two-year flood flow of the river (a level known as Q2, which has a 50% chance of being exceeded in any given year) Sediment would create short-term water quality impacts Would remove 320,000 cubic yards of rock material Would construct bridge pier in the flow of whitewater rafting	Would be constructed within Q2 flow of river Sediment would create short-term water quality impacts Would remove 70,000 cubic yards of rock material Would construct bridge pier in the flow of whitewater rafting	Would be constructed within Q2 flow of river Sediment would create short-term water quality impacts Would cut 358-foot-long by 30-foot-wide section of northern slope for placement of viaduct and remove 8,300 cubic yards of rock material Would construct bridge pier in the flow of whitewater rafting	Sediment would create short-term water quality impacts S2-V1: Would cut 510-foot-long by 30-foot-wide-section of northern slope for placement of tied-arch viaduct and remove 21,000 cubic yards of rock material. S2-V2: Would cut 65-foot-long by 30-foot-wide section of northern slope for placement of viaduct and remove 126 cubic yards of rock material.	Would remove between 1.05 and 2.10 acres of habitat for smallflower monkeyflower Mariposa clarkia, and Tompkins sedge Would remove the talus (80,000 cubic yards) of the rockslide Would remove a total of 2.10 acres of limestone salamander habitat, including impacts from construction	Would remove between 0.25 and 0.45 acre of habitat for smallflower monkeyflower Mariposa clarkia, and Tompkins sedge Would remove 292,000 cubic yards of rock material Would remove a total of 0.45 acre of limestone salamander habitat, including impacts from construction	Temporary bridges would impede whitewater rafting when the Q2 river flow is exceeded Temporarily eliminates Incline Road as a recreational trail
Parks and Recreation	Construction activities would temporarily affect Incline Road Would restore full access to Yosemite and other recreational activities within Mariposa County via State Route 140	Construction activities would temporarily affect Incline Road Would restore full access to Yosemite and other recreational activities within Mariposa County via State Route 140	Construction activities would temporarily affect Incline Road Would restore full access to Yosemite and other recreational activities within Mariposa County via State Route 140	Construction activities would temporarily affect Incline Road Would restore full access to Yosemite and other recreational activities within Mariposa County via State Route 140	Would restore full access to Yosemite and other recreational activities within Mariposa County via State Route 140	Would restore full access to Yosemite and other recreational activities within Mariposa County via State Route 140	The unavoidable failure of the bridges would eventually close the highway Temporarily eliminates Incline Road as a recreational trail Does not provide full access to Yosemite and other recreational activities via State Route 140
Community Character and Cohesion	Would restore full access between the communities along State Route 140	Would restore full access between the communities along State Route 140	Would restore full access between the communities along State Route 140	Would restore full access between the communities along State Route 140	Would restore full access between the communities along State Route 140	Would restore full access between the communities along State Route 140	Access between the communities along State Route 140 would eventually be eliminated when temporary detour bridges fail
Utilities/Emergency Services	Would restore full access for emergency vehicles. No utility relocations required.	Would restore full access for emergency vehicles. No utility relocations required.	Would restore full access for emergency vehicles. No utility relocations required.	Would restore full access for emergency vehicles. No utility relocations required.	Would restore full access for emergency vehicles. No utility relocations required.	Would restore full access for emergency vehicles. No utility relocations required.	Access for emergency vehicles would be eliminated when temporary detour bridges fail.

Potential Impact	Alternative C	Alternative T	Alternative S	Alternative S-2	Alternative R	Alternative T-3	No-build Alternative	
Traffic and Transportation/ Pedestrian and Bicycle Facilities	Construction activities would cause short-term closures of the highway and traffic delays Incline Road would be restored to accommodate bicycles and pedestrians The new roadway would include shoulders to accommodate bicycles	Construction activities would cause short-term closures of the highway and traffic delays Incline Road would be restored to accommodate bicycles and pedestrians The new roadway would include shoulders to accommodate bicycles	Construction activities would cause short-term closures of the highway and traffic delays Incline Road would be restored to accommodate bicycles and pedestrians The new roadway would include shoulders to accommodate bicycles	Construction activities would cause short-term closures of the highway and traffic delays Incline Road would be restored to accommodate bicycles and pedestrians The new roadway would include shoulders to accommodate bicycles	Construction activities would cause short-term closures of the highway and traffic delays Incline Road would be restored to accommodate bicycles and pedestrians The new roadway would include shoulders to accommodate bicycles	Incline Road would be restored to accommodate bicycles and pedestrians The new roadway would include shoulders to accommodate bicycles	Incline Road would be restored to accommodate bicycles and pedestrians The new roadway would include shoulders to accommodate bicycles	Restricts access for pedestrians and bicycles between communities
Visual/Aesthetics	Structures would retain the overall moderately high visual quality of the area	Structures would retain the overall moderately high visual quality of the area	Structures would produce an average reduction in visual quality to moderate	S2-V1: Structures would retain the overall moderately high visual quality of the area. S2-V2: Structures would improve the overall visual quality of the area to high.	Structures would produce an average reduction in visual quality to moderately low	Structures would improve the overall visual quality of the area to high	Structures provide a short-term visual quality of moderately high. Upon removal of the temporary structures, the landscape would be restored to its naturally high visual quality.	
Cultural Resources	Avoids altering any significant qualities of the already compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places. Avoids the bedrock mortar site.	Avoids altering any significant qualities of the already compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places. Avoids the bedrock mortar site.	Avoids altering any significant qualities of the already compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places. Avoids the bedrock mortar site.	Avoids altering any significant qualities of the already compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places. Avoids the bedrock mortar site.	Avoids altering any significant qualities of the already compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places. Avoids the bedrock mortar site.	Avoids altering any significant qualities of the already compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places. Avoids the bedrock mortar site.	Short-term altering of the already compromised Yosemite Valley Railroad grade. Upon the removal of the detour, the railroad grade would be returned to its previous state. Avoids the bedrock mortar site.	
Hydrology and Floodplain	Would encroach minimally on floodplain	Would encroach minimally on floodplain	Would encroach minimally on floodplain	Would encroach minimally on floodplain	Would encroach longitudinally on the floodplain	Would not encroach on the floodplain	Encroaches on the floodplain. Structures would be affected by 20-year flood event.	
Water Quality and Storm Water Runoff	Construction activities would cause short-term impacts to surface water. Storm water runoff could create long-term impacts to surface water.	Construction activities would cause short-term impacts to surface water. Storm water runoff could create long-term impacts to surface water.	Construction activities would cause short-term impacts to surface water. Storm water runoff could create long-term impacts to surface water.	Construction activities would cause short-term impacts to surface water. Storm water runoff could create long-term impacts to surface water.	Construction activities would cause short-term impacts to surface water. Storm water runoff could create long-term impacts to surface water.	Construction activities would cause short-term impacts to surface water. Storm water runoff could create long-term impacts to surface water.	Storm water runoff could create long-term impacts to surface water.	
Geology/Soils/Seismic/ Topography	Would remove 320,000 cubic yards of rock material with a disposal cost of \$17.6 million. Rock removal would create the potential for minor rockfalls in cut areas.	Would remove 70,000 cubic yards of rock material with a disposal cost of \$6.1 million. Rock removal would create the potential for minor rockfalls in cut areas.	Would cut 358-foot-long by 30-foot-wide section of northern slope for placement of viaduct and remove 8,300 cubic yards of rock material with a disposal cost of \$457,000. Rock removal would create the potential for minor rockfalls in cut areas.	Would remove 21,000 cubic yards of rock material with a disposal cost of \$1.2 million for S2-V1. S2-V2 would remove 126 cubic yards with a disposal cost of \$6,900. Rock removal would create the potential for minor rockfalls.	Would remove the talus of the rockslide, requiring the disposal of 80,000 cubic yards of rock material with a disposal cost of \$4.4 million. The removal could create the potential for exposure to future slides, minor rockfalls, and safety risk during construction.	Would remove 292,000 cubic yards of rock material with a disposal cost of \$24.6 million. Rock removal would create the potential for future slides and minor rockfalls in cut areas.	None	
Hazardous Waste/Materials	Potential exposure to elevated levels of arsenic from Incline Road.	Potential exposure to elevated levels of arsenic from Incline Road.	Potential exposure to elevated levels of arsenic from Incline Road.	Potential exposure to elevated levels of arsenic from Incline Road.	Potential exposure to elevated levels of arsenic from Incline Road.	Potential exposure to elevated levels of arsenic from Incline Road.	Potential exposure to elevated levels of arsenic from Incline Road.	

Potential Impact	Alternative C	Alternative T	Alternative S	Alternative S-2	Alternative R	Alternative T-3	No-build Alternative
Natural Communities	3.3 acres of oak woodland would be removed	0.4 acre of oak woodland would be removed	0.9 acre of oak woodland would be removed	1.7 acres of oak woodland would be removed	2.10 acres of oak woodland would be removed.	0.45 acre of oak woodland would be removed.	None
Wetlands and other Waters	0.06 acre of waters of the United States would be affected. 0.5 acre of riparian habitat would be removed.	0.06 acre of waters of the United States would be affected. 0.5 acre of riparian habitat would be removed.	0.05 acre of waters of the United States would be affected. 0.8 acre of riparian habitat would be removed.	1.5 acres of riparian habitat would be removed.	None	None	None
Plant Species	Two patches of copper moss would be removed.	Two patches of copper moss would be removed.	One patch of copper moss would be removed.	None	2.10 acres of Mariposa clarkia and Tompkins sedge habitat would be removed. 1.05 acres of smallflower monkeyflower habitat would be removed.	0.45 acre of Mariposa clarkia and Tompkins sedge habitat would be removed 0.25 acres of smallflower monkeyflower habitat would be removed One patch of copper moss would be removed	None
Animal Species	Temporary decrease in water quality would indirectly affect hardhead fish 3.3 acres of bat habitat would be affected.	Temporary decrease in water quality would indirectly affect hardhead fish 0.4 acre of bat habitat would be affected.	Temporary decrease in water quality would indirectly affect hardhead fish 0.9 acre of bat habitat would be affected.	1.7 acres of bat habitat would be affected	More than 2 acres of bat habitat would be affected, 1.05 acres west of the rockslide and 1.05 acres east of the rockslide	About 0.45 acre of bat habitat would be affected, 0.2 acre west of the rockslide and 0.25 acre east of the rockslide	None
Threatened and Endangered Species	Ground disturbance would affect habitat of the ringtail	Ground disturbance would affect habitat of the ringtail	Ground disturbance would affect habitat of the ringtail	Ground disturbance would affect habitat of the ringtail	Ground disturbance would affect habitat of the ringtail Would cut into the slope on the south side of the river near potential habitat for Merced clarkia and limestone salamander, affecting 2.1 acres of these habitats	Ground disturbance would affect habitat of the ringtail Would cut into the slope on the south side of the river near potential habitat for Merced clarkia and limestone salamander, affecting 0.45 acre of these habitats	None
Invasive Species	Disturbance of ground would cause dispersal of non-native weeds.	Disturbance of ground would cause dispersal of non-native weeds.	Disturbance of ground would cause dispersal of non-native weeds.	Disturbance of ground would cause dispersal of non-native weeds.	Disturbance of ground would cause dispersal of non-native weeds.	Disturbance of ground would cause dispersal of non-native weeds.	None
Cost	\$53.5 million	\$80.3 million	\$34.6 million	S2-V1: \$93.9 million S2-V2: \$38.3 million	\$78.9 million	\$179.2 million	N/A
Length of Construction	3 years	5 years	3 years	3 years	5 years	5 years	N/A

After the public circulation period, all comments will be considered, and Caltrans will select a preferred alternative and make the final determination of the project's effect on the environment. In accordance with the California Environmental Quality Act, Caltrans will certify that the project complies with the act, prepare findings for all significant impacts identified, prepare a Statement of Overriding Considerations for impacts that will not be mitigated below a level of significance, and certify that the findings and Statement of Overriding Considerations have been considered prior to project approval. Caltrans will then file a Notice of Determination with the State Clearinghouse that will identify whether the project will have significant impacts, whether mitigation measures were included as conditions of project approval, whether findings were made, and whether a Statement of Overriding Considerations was adopted. With respect to the National Environmental Policy Act, Caltrans, as assigned by the Federal Highway Administration, will document and explain its decision regarding the selected alternative, project impacts, and mitigation measures in a Record of Decision in accordance with the National Environmental Policy Act.

2.1.4 Alternatives Considered but Eliminated From Further Discussion

Alternative E (Slide Removal) proposed to remove the debris from the rockslide and restore State Route 140 on the existing alignment. This alternative was considered and withdrawn by the project development team for the following reasons:

- The rockslide would have to be removed from the top down, which would require building a 30-foot-wide, two-lane road to the top of the rockslide.
- The complete rockslide comprises approximately 798,000 tons of rock material. Removing, transporting and disposing of this material would take 200 trips each day for up to 300 working days, using the typical 15-ton-capacity mining trucks (3,000 tons of rockslide material each day) traveling from the project area to Midpines (about 20 miles each way).
- There is a potential that once the rockslide material was removed, additional material upslope could begin to slide down.
- A take of limestone salamander habitat could occur during construction due to the removal of the talus habitat for this California fully protected species.
- Potential dormant rockslides were identified adjacent to the Ferguson rockslide and could affect the highway if they become active in the future.

Alternative S-2 (Additional Variations) proposes multiple bridge types to span the Merced River and fit within the alignment of the canyon. A total of five bridge types were studied by Caltrans, which included tied-arch, slant-leg, steel-through truss,

suspension, and cable stay. While two bridge types were considered to be viable, (the tied-arch and slant-leg bridges, see section 2.1.1 Build Alternatives), the steel-through truss, suspension, and cable stay were determined non-viable for the following reasons:

- The project requires bridge spans to be placed on curved alignments. These bridge types are useful for straight alignments.
- These bridge types require more maintenance than concrete bridges, which increases maintenance costs.
- These bridge types take longer to build than concrete bridges.

Alternative T-2 (Western Tunnel Realignment) proposed to realign the highway south of the Ferguson rockslide by tunneling one mile through the mountain from the existing State Route 140 alignment. This alternative was considered during the alternative development process, but was rejected for the following reasons:

- This alternative is estimated to cost \$390 million.
- This alternative would take up to 7 years to build.
- This alternative would require the removal and transport of approximately 500,000 cubic yards of excavated material to a site 20 miles away in Midpines.
- A direct take of limestone salamander habitat could occur during construction.
- A tunnel of this size would require 3-foot diameter emergency exits placed throughout the entire length of the tunnel to provide vertical access to the top of the mountain from the tunnel.

Alternative A (At-grade Realignment) proposed to realign the highway to the northeast, spanning the Merced River with two at-grade concrete bridges. State Route 140 would bypass the rockslide on a half-mile of Incline Road and then span the river to meet with the existing alignment. This alternative was considered during the alternative development process, but was rejected for the following reasons:

- The design speed of this roadway alignment would be 25 miles per hour at the bridge entrances and exits, which is non-standard and poses a safety concern for motorists.
- A substantial side-hill excavation into a one-half mile section of the northern canyon wall would be required.

- Prolonged closures of the temporary detour would be necessary, denying access to Yosemite National Park via State Route 140.
- The conversion of a half-mile of Incline Road into highway would restrict trail use activities to the shoulders of the road.
- An ongoing slide-monitoring program would have to be established due to the potential of future rockslides affecting the at-grade bridges.
- At-grade bridges would be more vulnerable to a future rockslide.
- The at-grade bridges would be constructed at a level below a 20-year flood event posing a longitudinal encroachment.

2.2 Permits and Approvals Needed

The following permits, reviews, and approvals would be required for project construction:

Table 2.2 Permits and Approvals Needed

Agency	Permit/Approval	Status
U.S. Forest Service	Biological Evaluation	Submittal anticipated prior to the finalization of the environmental document
U.S. Forest Service	Letter of Consent for the issuance of a Department of Transportation easement	Anticipated prior to construction
U.S. Department of Transportation	Department of Transportation Easement	Anticipated prior to construction
U.S. Forest Service	Section 7(a) Wild and Scenic Rivers Act Evaluation	Evaluation anticipated following the selection of a preferred alternative
California Department of Fish and Game	1602 Streambed Alteration Agreement	Submittal anticipated prior to construction
California Department of Fish and Game	Section 2081 Permit for the potential removal of Merced clarkia during construction	Submittal anticipated prior to construction
California Regional Water Quality Control Board	Section 401 Certification for a Water Discharge Permit	Submittal anticipated prior to construction
U.S. Army Corps of Engineers	Section 404 Nationwide Permit 14 for filling or dredging waters of the United States	Submittal anticipated prior to construction
State Historic Preservation Officer	Determinations of Eligibility for Cultural Resources	Concurrence Letter received October 10, 2007 See Appendix D

Chapter 3 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

This chapter explains the impacts that the project would have on the human, physical, and biological environments in the project area. It describes the existing environment that could be affected by the project, potential impacts from each of the alternatives, and proposed avoidance, minimization, and/or mitigation measures. Any indirect impacts are included in the general impacts analysis and discussions that follow.

As part of the scoping and environmental analysis conducted for the project, the following environmental issues were considered, but no adverse impacts were identified. Consequently, there is no further discussion regarding these issues in this document.

Growth—This project is not anticipated to encourage unplanned growth because the build alternatives would only reestablish full access to State Route 140 (Community Impact Assessment, July 2007).

Farmlands/Timberlands—There is no farmland or timberland in the project area (Community Impact Assessment, July 2007 and Visual Impact Assessment April 2009).

Paleontology—This project would not affect paleontological resources (Paleontological Identification Report, June 29, 2007 and Updated Paleontological Identification Report, August 25, 2008).

Energy—The proposed project would not affect the way energy is produced or used because the build alternatives would only reestablish full access to the section of State Route 140 damaged by the Ferguson rockslide.

3.1 Human Environment

3.1.1 Land Use

3.1.1.1 Existing and Future Land Use

Affected Environment

Current land use was identified using Mariposa County's 2003 General Plan and the Sierra National Forest Land and Resource Management Plan. More than half of the land in Mariposa County is federally owned. Most notable is Yosemite National Park, which occupies more than 250,000 acres of Mariposa County. Two national forests, Stanislaus and Sierra, occupy most of the land within the county. The Stanislaus National Forest is mostly west of Yosemite and north of the Merced River, while the Sierra National Forest is primarily west of Yosemite and south of the Merced River (see Figure 1-1). The project area is in the Sierra National Forest. The Bureau of Land Management also owns segments of land, primarily located along Merced River's wild and scenic corridor.

The land within the project area is considered rural and is managed by the U.S. Forest Service. There are no residences or businesses within the limits of the proposed project. The Merced River, which flows through the project area, is designated as a Wild and Scenic River under the Wild and Scenic Rivers Act (see Section 3.1.1.3). The existing State Route 140 operates on Forest Service land pursuant to a Special Use Permit with the U.S. Forest Service. The temporary detour was constructed on Forest Service land through an agreement with the U.S. Forest Service.

Environmental Consequences

The proposed project would not require or encourage a change in land use. The build alternatives would only reestablish full access for motorists using State Route 140. Alternatives C, T, S, and S2 would require an amendment to the Department of Transportation easement that would provide for the realignment of the highway. Under the No-build Alternative, the temporary detour would remain in use until its eventual failure, which would also require an amendment to the current Special Use Permit with the U.S. Forest Service.

Avoidance, Minimization, and/or Mitigation Measures

No mitigation measures would be required.

3.1.1.2 Consistency with State, Regional, and Local Plans

Affected Environment

The Mariposa County General Plan, the Yosemite Valley Plan, and the Economic Vitality Strategy and Implementation Plan for Mariposa County focus on maintaining accessibility to Yosemite National Park, rivers, lakes, national forests, rural scenery, scenic routes, and historic sites within Mariposa County. The plans further promote the enhancement and preservation of the following:

- Yosemite and national forest lands
- Large and intact areas of agricultural and forest lands
- Separate and unique communities that support larger rural developments
- Close proximity to outdoor recreation
- Historic structures, ruins, and monuments

The Mariposa County General Plan addresses a broader range of goals that include land use, economic development, transit and transportation, and historic resources. In November 2007, Mariposa County developed an Economic Vitality Strategy and Implementation Plan with the primary goal of improving the economy in Mariposa County through encouraging tourism. Efforts to accomplish the goals set forth in the county's general plan and the economic implementation plan include the following:

- Facilitating improvements to state highways that serve Mariposa County
- Maintaining an effective transit system
- Maintaining an effective emergency system
- Preserving, protecting, and enhancing regional tourism opportunities and resources
- Creating visitor access to communities and points of interest
- Providing job growth and sustaining county revenues by enhancing and expanding sectors of the economy that serve visitors
- Using the county's historic sites to increase tourism opportunities
- Creating historic districts to preserve the county's historic character

These efforts depend on State Route 140, as well as other routes, to provide full access to all communities and recreational activities within Mariposa County. Maintaining the highways and roads in the county is an important part of accomplishing Mariposa County's goals.

The Sierra National Forest Land and Resource Management Plan was developed to direct the management of the Sierra National Forest. This plan provides goals for the transportation and facility resource and requires a broad range of developed and dispersed recreation opportunities that balance with existing and future demand. Three levels of direction make up the Sierra National Forest Land and Resource Management Plan. The first level is the Forest Goals and Objectives, which provide broad and overall direction for the type and amount of goods and services the Forest will provide in the future. The second level is a discussion of future conditions of the forest. The third level is general Management Prescriptions and Management Standards and Guidelines.

The Sierra National Forest Land and Resource Management Plan states river segments totaling 82.5 miles will be managed as part of the National Wild and Scenic River System. Some of the activities in the area, like the studying of meta-sedimentary rocks, photographing the local flora in the riparian zones within the corridor, whitewater rafting, picnicking, swimming, fishing, walking/hiking, viewing natural scenery, camping, and studying several historic sites are expected to increase. Facility construction will be implemented within Scenic/Recreational river segment designations commensurate with existing uses and conditions.

The Sierra National Forest Land and Resource Management Plan emphasizes preservation of the free-flowing condition of selected rivers having various outstanding remarkable features and notable values for inclusion in the National Wild and Scenic River System. The plan calls for the management of recommended segments in accordance with the Wild and Scenic Rivers Act of 1968. Recreational segments allow recreational development along the river to provide opportunity to engage in activities enhanced by the river. Recreational designations do not preclude consideration of dams and /or diversions in certain situations.

The management and resource guidance in the Sierra National Forest Land and Resource Management Plan relates to the Merced Wild and Scenic River by prescribing management of designated river corridors according to classification and direction established in the Wild and Scenic River management plans. The administering of permits to whitewater raft on the Merced River would be coordinated with other agencies.

The South Fork and Merced Wild and Scenic River Implementation Plan provide for management guidance for the Wild and Scenic Rivers Act. The Wild and Scenic

Rivers Act and agency guidelines are used to guide the development of objectives, policies and the kind, type and method of management actions needed to maintain or enhance the Wild and Scenic River values. This plan incorporates the management direction for the Sierra and Stanislaus National Forest and the Bureau of Land Management's Merced River Management Plan.

The South Fork and Merced Wild and Scenic River Implementation Plan is needed to resolve specific resource questions and conflicts occurring in the designated wild and scenic rivers, give the public and agency officials a consistent vision of the future of the wild and scenic rivers, establish priorities for needed projects, and serve as a basis for U.S. Forest Service and Bureau of Land Management budgetary requests for management activities.

Environmental Consequences

The build alternatives would be consistent with the Mariposa County General Plan, the Yosemite Valley Plan, the Economic Vitality Strategy and Implementation Plan for Mariposa County, the Sierra National Forest Land and Resource Management Plan, and the South Fork and Merced Wild and Scenic River Implementation Plan by restoring full access to all vehicle types traveling on State Route 140. The No-build Alternative would not be consistent with federal, state, regional, and local plans because a vital transportation link between communities and access to Yosemite National Park and other tourist activities would be eventually eliminated due to eventual failure of the temporary bridges or their support. The failure of the No-build Alternative would restrict access to the Outstandingly Remarkable Values associated with the Merced River in the project area by eliminating motor vehicle traffic.

Avoidance, Minimization, and/or Mitigation Measures

No mitigation measures would be required for the build and No-build alternatives.

3.1.1.3 Wild and Scenic Rivers

Regulatory Setting

Projects affecting Wild and Scenic Rivers are subject to the National Wild and Scenic Rivers Act (16 U.S. Code 1271). A river designated wild and scenic under the Act, along with its immediate environment, is included in the National Wild and Scenic Rivers System if it possesses "outstandingly remarkable values," defined by the Wild and Scenic Rivers Act as "scenic, recreational, geologic, fish and wildlife, vegetation, cultural, or other similar values." A river designated wild and scenic shall be preserved in a free-flowing condition, and shall be protected from water quality

degradation. In addition, the river's immediate environments are protected for the benefit and enjoyment of future generations. Any development impacting the free-flowing condition of the Merced River in the project area would require a Congressional waiver of the Wild and Scenic Rivers Act.

The river administrating agency or federal department having jurisdiction over any lands, which include, border upon, or are adjacent to, any river included in the National Wild and Scenic Rivers System shall take such action respecting management policies, regulations, contracts, plans, affecting such lands, as may be necessary to protect such rivers in accordance with the purposes of the Wild and Scenic Rivers Act. In addition, where appropriate, these agencies and departments may enter into written cooperative agreements with the appropriate state or local official for the planning, administration, and management of federal lands which are within the boundaries of a designated Wild and Scenic River. Particular attention shall be given to scheduled timber harvesting, road construction, and similar activities, which might be contrary to the purposes of the Wild and Scenic Rivers Act. Detailed boundaries shall be established by the river administrating agency, which boundaries shall comprise ¼ mile from the ordinary high water mark on both sides of the river and include an average of not more than 320 acres of land per mile.

Every wild, scenic or recreational river in its free-flowing condition, or upon restoration to this condition, shall be classified, designated, and administered as one of the following:

1. Wild: undeveloped, with river access by trail only
2. Scenic: undeveloped, with occasional river access by road
3. Recreational: some development is allowed, with road access

Affected Environment

A River Geomorphology Report, January 2009, a revised Natural Environment Study, January 2009, a Historic Properties Survey Report, September 2007, a revised Geotechnical Report, March 2008, a Paleontological Report, August 2008, a Water Quality Assessment Report, November 2008, a Noise Study Report, September 2008, and the Merced River, South Fork Merced River Environmental Impact Statement were used to determine potential impacts to the Merced River as a result of the proposed project.

The Merced River originates in the High Sierra of Yosemite National Park. The river collects its water from Mount Hoffman, Mount Raymond, Tenaya Lake, and the Cathedral Range and flows freely into Yosemite Valley. The Merced River creates deep canyons as it continues through the Sierra and Stanislaus national forests. The river eventually makes its way down into the San Joaquin Valley.

The Merced River has two major branches. The main river branch goes through Yosemite Valley. The South Fork branch starts at the southern end of Yosemite and flows through some of the wildest and least developed land in the Sierra National Forest before it joins the main branch just upstream of the Ferguson rockslide.

Development near the Merced River, including the former Yosemite Valley Railroad line (now Incline Road and the temporary State Route 140 detour), occurred because of the river's proximity to Yosemite National Park. The designation in 1987 as a federal Wild and Scenic River was sought to protect the largely undeveloped river from further development to preserve the wild, scenic, and recreational characteristics.

The segment of the Merced River that flows through the project area is classified as recreational, the least restrictive of the three classifications attributed to segments of Wild and Scenic Rivers because of the presence of the highway and Incline Road, which provides access to the recreational activities on the river. This 5.5-mile segment extends from the confluence of the South Fork Merced River to the northwest boundary of the Sierra and the southeast boundary of the Stanislaus National Forests. The river here is free flowing; the slopes alongside it are sparsely vegetated, making the river highly visible to the traveling public. Whitewater boating, fishing, and picnicking are popular activities along this part of the Merced River.

The U.S. Forest Service is responsible for the administration of this recreationally classified segment. The Bureau of Land Management, through a Memorandum of Understanding and Letter of Agreement with the U.S. Forest Service, is the lead agency for managing whitewater boating. The Bureau of Land Management issues permits to whitewater rafting outfitters as well as private boaters that launch boats at locations both above and below the project area. These locations include Redbud, Indian Flat, and Briceburg. In addition to issuing permits, the Bureau of Land Management maintains and monitors the permit system on the Merced River. All issues affecting the recreational value of the river would be reported to the U.S. Forest Service.

At the request of the U.S. Forest Service and the Bureau of Land Management, Caltrans initiated a Recreational Survey designed to capture the opinions of recreational stakeholders such as whitewater rafters, campers, hikers, bikers, and anglers as well as the general public with regards to the proposed project alternatives' impacts on the recreational value of the Merced River. The survey began in 2008 and continued through the rafting season 2009. Caltrans, the U.S. Forest Service, and the Bureau of Land Management agree that the data collected from the survey will be used during the preparation of the Final Environmental Impact Statement/ Environmental Impact Report and for the selection of a preferred alternative.

Wild and Scenic rivers are defined by resources that contribute to that designation; these resources are termed *outstandingly remarkable values* by the Wild and Scenic Rivers Act. Such values include the free-flowing nature of the river and its value as a recreational facility. The outstandingly remarkable values of the Merced Wild and Scenic River within the project area are geology, recreation, wildlife, vegetation, and cultural/historical benefits. The details of each outstandingly remarkable value are explained below.

The U.S. Forest Service as the river administrator has established the Wild and Scenic River boundary for the segment of the Merced River affected by the proposed project as extending ¼ mile above the two-year flood event (the Q2) on both sides of the river. The Q2 represents the boundaries of the river during a flood event that has a 50 percent chance of occurring in any given year. See Chapter 5 Comments and Coordination for more information.

Free-Flowing Condition and Water Quality

The Merced River is free flowing and traces a relatively straight path from Yosemite Valley to the San Joaquin Valley, with the exception of the bend to the north of the project area. The water quality at the project area is good to excellent.

Geology

The Merced River Canyon is a steep inner gorge with highly fractured rocks that formed as a result of tectonic uplifting and the cutting of the Merced River. Exposure of the rocks within the canyon has provided an opportunity for understanding the geologic history of the area. Glaciation left its imprint on this part of the Merced River Canyon as glacial outwash deposits.

Between El Portal and Briceburg, the river valley cuts through rocks that are geologically significant. An interpretive sign approximately ¼ mile west of the

Ferguson rockslide describes the rocks within the canyon as very old metamorphic (changed in a pronounced way by the application of pressure, heat or water) rocks. The bedrock in the Merced Canyon near the Ferguson rockslide consists of these types of rocks, primarily the Phyllite and Chert of Hite's Cove. The bedrock also contains limestone lenses or beds (small, localized areas of limestone) with an extensive limestone bed on the west side of the horseshoe bend. This limestone bed is important because it yielded early Triassic conodont fossils.

The Ferguson rockslide is a natural feature that was present before State Route 140 was built.

Recreation

The recreational outstandingly remarkable value consists of three primary recreational activities: whitewater boating, camping, and hiking. Whitewater boating is the most popular activity on the river within the project area and has been occurring on the river since the 1970s, averaging 8,000 to 10,000 boaters annually. The whitewater boating season typically begins in March and ends in June or July depending on the snow pack.

Camping is not common in the area because of the steep canyon walls found in the project area. More suitable camping opportunities can be found in the flat open terrain upstream of the project area near Foresta Bridge. Incline Road provides opportunities for hiking and biking and is occasionally used by equestrians. Also, fishing and picnicking can be popular activities among those residing near or visiting the project area.

Wildlife

The limestone salamander is listed as a sensitive species by the Pacific Southwest Region of the U.S. Forest Service and was designated as a threatened species by the State of California in 1971. The threatened designation by the State of California indicates that the species is at a high risk of extinction due to restricted range and few populations. Threats to this species include gold mining operations, highway construction, water development, and quarrying for limestone. It is also designated as a fully protected species pursuant to the California Fish and Game Code Section 5050. Designation as a fully protected species prevents the Department of Fish and Game from authorizing the incidental "take" of the species, as defined in Fish and Game Code Section 86, through the usual Fish and Game Code Section 2081 permit process.

Limestone salamanders (*Hydromantes brunus*) live in crevices of cliffs and ledges and under the canopy of foothill-oak woodland, especially where the rocks are overgrown with moss. They are active during the fall, winter, and spring rains, especially during cold spells. The limestone salamander only occurs along some segments of the Merced River drainage, all of which are within a 5-mile radius of the project area. These segments are the Merced River Canyon above Briceburg, west to a region known as Hell Hollow, a short distance up the North Fork of the Merced River, at Hite's Cove on the South Fork of the Merced River, and in the area of the rockslide.

Limestone salamanders were observed during surveys at various locations on the south side of the Merced River within the project area.

Vegetation

The Merced River Canyon is renowned nationally and internationally for the spectacular display of wildflowers that may be seen in a good rain year. People are especially attracted to the South Fork Trail that leads to Hite's Cove, but the entire river corridor is an attraction because of the flowers' visual appeal. Between El Portal and Briceburg, there are five Region 5 sensitive plants growing adjacent to the river. These are Yosemite onion (*Allium yosemitense*), Tompkins' sedge (*Carex tompkinsii*), Merced clarkia (*Clarkia lingulata*), Congdon's woolly sunflower (*Eriophyllum congdonii*), and Congdon's lewisia (*Lewisia congdonii*).

During plant surveys conducted at the project area, the Forest Service sensitive plants Mariposa clarkia (*Clarkia biloba* spp. *australis*) and the elongate copper moss (*Mielichhoferia elongate*) were identified. Two rare plants, the smallflower monkeyflower (*Mimulus inconspicuus*) and Tompkins' sedge (*Carex tompkinsii*), were also identified.

Cultural/History

The Merced River corridor contains features associated with historic mining, logging, and transportation. These features include the Yosemite Valley Railroad Grade, Jenkins Hill Trail, and State Route 140.

Each of the three linear resources—the Jenkins Hill Trail, the Yosemite Valley Railroad, and State Route 140—are tens of miles in length and only short segments of each resource are present within the project area. The portions of these resources that are within the project area lack the integrity of materials, setting, feeling, or design for their respective periods of significance: (1) the Jenkins Hill Trail segment is

intermittent, with portions obliterated by slope wash; (2) the rails and ties of the Yosemite Valley Railroad were pulled-up and sold with the rest of the equipment in 1946, and flooding in 1955 and 1997 washed away portions of the grade; and, (3) the highway, despite being on its original alignment, was damaged by flooding in 1937 and 1997 and is presently covered by the recent rockslide that deposited millions of tons of rubble onto its surface.

The Merced River contains sites where there is evidence of occupation or use by Native Americans. The sites are prehistoric bedrock mortars and may have national or regional importance for interpreting prehistory. The Merced River has a known historic association with the Southern Sierra Miwok. River-related resources such as plants and animals are important to them. The American Indian Council of Mariposa has shown interest in the resources of the river, especially the use of plants for medicine, food, and basket weaving.

Cultural/History resources may include historic properties or sites of national importance. Cultural Resources are also protected under Section 106 of The National Historic Preservation Act, which specifically looks at the effects of a project on historic properties eligible for and included in the National Register of Historic Places, see Section 3.1.6 for more information on Cultural Resources and the Section 106 process.

Environmental Consequences

Free-Flowing Condition and Water Quality

The upstream bridge for Alternatives C and T would:

- Construct bridge piers within the two-year flood flow of the river.
- Cause the river to get deeper about 1 foot upstream of the upstream bridge along the left side (facing in the direction of the current), when the river is flowing at or above the Q2. This depth increase would be caused by a pier being placed in the outside bend of the river, where flow rates naturally increase.
- Cause a corresponding minor decrease of 1 foot in the depth of the water downstream of this pier.
- Construct the right bank pier of the upstream bridge at the edge of the Q2 water level, which would not affect flow rates or water depth.
- Slightly change the speed and force of the river's flow from its natural condition.
- Increase the speed of the river in between the piers 1 to 1.5 feet per second with an even greater flow occurring to the left of the left bank pier.

- Cause the river to pool around the left bank pier.
- Affect the movement of sediment just to the right of the left bank pier. At this pier, the flow velocity would increase enough that the river could potentially transport cobble- to boulder-sized material, thus changing the contours of the river. However, since changes of this magnitude have been a natural feature of the evolution of the Merced River and the Merced River Canyon, these alternatives would have little effect on the natural character of the river in this area.

At the downstream bridge for Alternatives C and T:

- The water would get a little deeper just upstream of the right bank pier.
- The left bank pier of the downstream bridge would not affect flow rates or depth.
- The construction of the bridge would slightly change the speed and force of the river's flow from its natural condition.
- The flow between the piers would increase the speed of the river 1 to 1.5 feet per second.
- The river would pool around both piers.
- The placement of this bridge within the Q2 flow of the river would not affect the movement of sediment.

The upstream bridge for Alternative S would:

- Construct bridge piers within the Q2 flow of the river.
- Cause the river to deepen about a foot at the left bank pier, an effect that would extend upstream roughly 200 feet. This pier would be placed in the bend of the river where the river naturally flows at a higher velocity.
- Cause minor changes to the river at the right bank pier, which is protected by a river bar located upstream.
- Cause slight depressions in the river water surface that last for about 10 to 20 feet downstream of the bridge piers.
- Cause the flow of the river to increase about 2 feet per second between the piers due to the constriction of the river by the pier placement.
- Cause a decrease in the flow velocity in the areas immediately upstream and downstream of the left bank pier. As the water reaches this pier, the flow is separated and loses its momentum.
- Increase the concentration of flow between the piers, which would increase the chance that sediments would be carried along the left side of a bar located on the

right side of the river. This could cause the bar to permanently change in size; however the river's ability to move sediment in this area is relatively small, which suggests a small impact on the bar.

At the downstream bridge for Alternative S:

- The piers are largely out of the river flow and would have minimal to no effect on the river velocity.
- The river would not deepen because the piers supporting the bridge would be out of the water.

S-2 (Both Variations):

Both variations of Alternative S-2 would construct bridges above the Q2 or active bankfull river channel. The free-flowing condition of the river would not be permanently impeded. Long-term water quality impacts may occur from storm water run-off and bridge maintenance activities.

Third Temporary Bridge:

A third temporary bridge would need to be constructed for Alternatives C, T, S, and S2-V1 upstream of the current temporary bridges. The placement of this bridge would be the same for these alternatives. This bridge would:

- Temporarily increase flow depths by 1 to 2 feet as the bridge would back water up for about 100 feet upstream.
- Temporarily increase flow velocities, as the river is forced around the right pier of this bridge, by 2.5 feet per second.
- Create a potential for the river bed to become eroded from the increased velocity and enhanced sediment mobility.
- Not affect depth or velocity of the river around the left pier as it would be placed on a bar in shallow water.

Alternatives R and T-3:

Alternatives R and T-3 would place structures on the existing State Route 140 and above the bed and bank of the river. These alternatives would not affect channel geometry, slope, form, or navigability.

No-build Alternative:

The downstream bridge of the No-build Alternative was constructed above the Q2 flow of the river channel, therefore less than adverse impacts were expected to occur on the channel geometry, slope, form, or navigability. The upstream bridge was constructed slightly below the Q2 flow; however effects to the free-flowing condition, channel geometry, slope, form, or water quality were also expected to be less than adverse. This was because the channel material, which is dominantly composed of boulder-sized rocks, is very stable. Excessive scour was not expected to occur because the bridges were designed to be temporary and the likelihood of the river flow exceeding Q2 during their expected lifespan is considered low. However, when evaluating the long-term effects of these temporary bridges, channel scour would likely occur due to the increased likelihood for larger river flows, between the 25-year and 100-year flood events. With larger flows, the right bank pier of the upstream bridge would impede whitewater rafters.

At the Q2 flow, neither of the No-build Alternative bridges increases the depth of the river when compared to the river in its natural state or without bridges. At the upstream bridge right side abutment, a narrow strip of decreased water level is expected along the far right bank. At the downstream bridge left abutment, the river flow decreases 2 to 3 feet per second and closer to the center of the channel, the flow increases up to 1 foot per second causing a separation in flow. The No-build Alternative would only produce minor changes in the flow velocity of the river, with slightly higher flow rates in the center of the channel just below the downstream bridge and at the center pier of the upstream bridge. Since the change in flow velocity is minimal, the potential for the river to move sediment is generally unchanged from the river in its natural condition.

Recreational Effects from Construction

For the construction of Alternatives C, T, S, and S-2, necessary falsework would be temporarily placed within the Q2 flow of the river channel for the duration of construction, perhaps as long as 2 to 3 years. However, a segmental bridge construction method, erecting the bridge in segments rather than as a whole, could be used to reduce the amount of falsework placed within the Q2 flow. This construction method is more costly and requires thicker columns but using it would minimize the temporary impacts to the free flow of the river.

Short-term impacts to surface water quality could occur during the construction of this project for all build alternatives. The potential surface water quality impacts are as follows:

- Increases in sediments, turbidity (cloudiness), and total dissolved solids
- Toxicity caused by chemical substances originating from construction activities.
- Impacts may occur from exposing loose soil during excavation, as well as grading and filling activities. Suspended solids, dissolved solids, and organic pollutants in surface water runoff could increase when nearby soils are disturbed and dust is generated. Changes in storm water drainage could potentially affect the water quality as well.

Storm water runoff from the bridges could cause long-term surface water impacts, as could bridge maintenance activities. The No-build Alternative could cause short-term surface water impacts from bridge maintenance activities until the eventual removal of the temporary bridges. Best management practices and ongoing coordination with the Army Corps of Engineers would be incorporated into the project to reduce all potential impacts as much as practicable, see Section 3.2.2 for more information.

Geology

Alternatives C and T would require minor excavation for the placement of the bridge piers and either cutting or blasting and drilling to construct the tunnel and cuts in the northern canyon slope. Alternatives C and T would require the removal of 320,000 and 70,000 cubic yards of rock material, respectively.

Alternative S would require minor excavation with the construction of the bridge piers. Placement of the viaduct section of the roadway on the northern canyon slope would require a cut into the slope 358 feet long by 30 feet wide. And 8,300 cubic yards of rock material would be removed.

S2-V1 along with S2-V2 would require minor excavation with the construction of the bridge piers. Placement of the S2-V1 viaduct section of the roadway on the northern canyon slope would require a 510 feet long by 30 feet wide cut into the slope. And 21,000 cubic yards of rock material would be removed. Placement of the S2-V2 viaduct section of the roadway on the northern canyon slope would require a 65 feet long by 30 feet wide cut into the slope. And 126 cubic yards of rock material would be removed.

Alternative T-3 would require blasting and drilling underneath the rockslide to construct the 2,200 feet of tunnel. And 292,000 cubic yards of rock material would be removed. Cuts would be required at the tunnel openings for the placement of retaining walls.

Alternative R would require the removal of the rockslide talus, approximately 80,000 cubic yards, during the construction of the tunnel/rockshed. The tunnel openings would be placed 150 feet from the flanks of the rockslide to prevent potential rockfall from rolling onto the roadway. Cuts into the canyon wall would be required for the placement of retaining walls.

The build alternatives would not excavate near the limestone bed that yielded fossil parts. Additionally, microfossils in the surrounding areas are not unique but rather abundant and widespread.

The No-build Alternative would not excavate in the areas containing fossil parts or glacial deposits with the removal of the temporary structures. The eventual removal of the temporary bridge abutments would also restore the contours of the landscape to its original setting. The No-build Alternative would not have any short-term impacts on geology.

Recreation

The Alternative S-2 bridges (for both variations) would be constructed at an elevation above the river flow line at the Q2 or 8,871 cubic feet per second. Whitewater rafting should not be affected or impeded as this flow is typically on the higher end of the rafting range.

Alternative S would affect whitewater rafters as the left bank pier of the upstream bridge is located at the margin of some of the highest river flows in the project area. The river would carry rafters towards the pier at velocities of 12 to 14 feet per second, presenting navigation challenges and posing risk to rafters unable to avoid the pier. The pier could also potentially trap river debris such as logs, posing an additional threat to rafters.

Much as with Alternative S, the left bank pier of the upstream bridge for Alternatives C and T would affect rafting as rafters would need to steer away from the pier in order to avoid colliding with or becoming pinned against it.

Alternatives R and T-3 would not affect the recreation outstandingly remarkable value because they would be constructed outside the bed and banks of the river.

The No-build Alternative placed the upstream bridge center pier within the river flow as a short-term solution to the closure of State Route 140. However, it is located along the right side of the river flow as well as on the inside of the bend. The river carries rafters to the outside bend, which prevents rafters from colliding with the pier. For the upstream bridge, rafters would have approximately 100 feet of river in which to safely travel. The temporary bridges of the No-build Alternative would be removed along with potential impacts to river rafters.

For details on how noise would affect the recreational user, refer to Section 3.2.5.

All of the build alternatives would restore Incline Road to its natural state so it can return to its use as a recreational trail for hiking and biking. Access to fishing would also be maintained by the build alternatives. The No-build Alternative would temporarily restrict hiking and biking activities on Incline Road as long as it remains in use as the temporary detour. Once the temporary bridges are removed and the highway closed to through traffic, access to fishing, hiking, biking, and whitewater rafting would be restricted.

Caltrans, the Bureau of Land Management, and the U.S. Forest Service conducted a recreational survey from the fall of 2008 through the summer of 2009. The purpose of the survey was to gather input on the proposed project's effects to the Merced River from individuals that whitewater raft, fish, camp, bike, and hike on and along the Merced River near the project area. The results of the survey are currently being evaluated and, depending on the results of the recreational survey, the proposed build alternatives could present additional impacts to the recreation value. Those results would be used during the preparation of the Final Environmental Impact Statement/Environmental Impact Report and during the selection of the preferred alternative.

Impacts from the construction of the build alternatives would be temporary and would require minimal closures of the highway as traffic would be maintained throughout construction on the temporary detour. Construction activities such as excavation and falsework construction would occur within the river channel. These construction activities would temporarily affect whitewater rafting as boats would pass through the construction area and rafting outfitters would need to drive through the construction zone to drive rafters back to their vehicles. Hikers and bikers passing through the area

would also be affected by the construction activities. See Section 3.6 for details on construction methods.

Wildlife

Alternatives C, T, S, and S-2 would avoid taking limestone salamander because its habitat would not be removed.

Alternatives R and T-3 would directly remove 2.10 acres and 0.45 acre of limestone salamander habitat and likely cause a death to the species and therefore a take in accordance with the California Endangered Species Act.

Suitable limestone salamander habitat and the presence of this species occur on the southern slope adjacent to the existing State Route 140. The No-build Alternative does not disturb the southern slope beyond the limits of the remaining highway.

Vegetation

Alternatives C, T, S, and S-2 would completely avoid the known populations of Merced and Mariposa clarkia, Tompkins' sedge, and the known populations of smallflower monkeyflower.

Alternatives R and T-3 would cut into the slopes on the south side of the river where Tompkins' sedge habitat has been identified. Alternative R would affect 2.10 acres of habitat, and Alternative T-3 would affect 0.45 acre of habitat. These alternatives would cut into the slopes on the south side of the river where populations of Mariposa clarkia have been identified. Alternative R would affect 2.10 acres of habitat, and Alternative T-3 would affect 0.45 acre of habitat. Alternatives R and T-3 could potentially affect 1.05 acres and 0.25 acre of smallflower monkeyflower habitat.

Alternatives R and T-3 would cut into the slope on the south side of the river where unconfirmed observations of Merced clarkia were made. Although there were no confirmed sightings, the project area is considered potential habitat. Alternatives R and T-3 would affect 2.10 acres and 0.45 acre of habitat, respectively.

Alternatives C, T, S, and T-3 would remove some or all of the patches of the copper moss that are along the highway and the temporary detour. Alternative R would completely avoid the moss.

The No-build Alternative would not affect vegetation during its lifespan or upon the removal of the temporary bridges.

Cultural/History

The build alternatives and the No-build Alternative would not alter the condition of the bedrock mortar sites.

The portions of the Yosemite Valley Railroad, the Jenkins Hill Trail, and State Route 140 within the project area were determined to lack the integrity of materials, setting, feeling, or design for their respective periods of significance. Thus, the build alternatives would not diminish any significant qualities of these already compromised segments of the resources. See Section 3.1.6 for more information on these resources' eligibility for or included in the National Register of Historic Places.

The No-build Alternative leaves intact the bridge abutments constructed adjacent to Incline Road or the former Yosemite Valley Railroad and the pavement along Incline road. These structures would have a short-term effect on the appearance of the railroad grade. These structures and the pavement would eventually require removal and eliminate the impact to the former Yosemite Valley Railroad.

Cumulative Impacts

When the impacts from the emergency project that constructed the temporary detour in August 2006 and then later reconstructed the temporary bridges in 2008 to provide access for essential traffic are added to the impacts from the build alternatives, the following cumulative impacts to the Wild and Scenic River's Outstandingly Remarkable Values would occur.

Past Impacts from Emergency Projects

- Vegetation Outstandingly Remarkable Value - in coordination with the U.S. Forest Service, two Tompkin's sedge plants were transplanted but did not survive.
- Free-Flowing Condition and Water Quality - the emergency projects constructed a downstream bridge above the Q2 flow of the river channel; therefore less than adverse impacts occurred on the channel geometry, slope, form, or navigability. The upstream bridge was constructed slightly below the Q2 flow; however effects to the free-flowing condition, channel geometry, slope, form, or water quality were also less than adverse.

Future Impacts from Proposed Project

For Alternative C:

- Replace the bridges that are temporarily within the bed and banks of the river with bridges that would permanently impede the free flow of the river and obstruct whitewater rafting.
- Create a long-term water surface quality impact from bridge maintenance activities while the temporary bridges had only a short-term effect. Sediment entering the river from construction activities would remain a temporary effect from the construction of the alternative and the removal of the detour.
- Rock material removal in the amount of 320,000 cubic yards from the northern canyon slope would be required beyond what was originally a temporary dispersal of rock material from the placement of the temporary bridges. Once these bridges are removed, the riverbank contours would be restored to their original condition at that particular location. However, new piers would be constructed within the riverbank.

For Alternative T:

- Replace the bridges that are temporarily within the bed and banks of the river with bridges that would permanently impede the free flow of the river and obstruct whitewater rafting.
- Create a long-term water surface quality impact from bridge maintenance activities while the temporary bridges had only a short-term effect. Sediment entering the river from construction activities would remain a temporary effect from the construction of the alternative and the removal of the detour.
- Rock material removal in the amount of 70,000 cubic yards from the northern canyon slope would be required beyond what was originally a temporary dispersal of rock material from the placement of the temporary bridges. Once these bridges are removed, the riverbank contours would be restored to their original condition at that particular location. However, new piers would be constructed within the riverbank.

For Alternative S:

- Replace the bridges that are temporarily within the bed and banks of the river with bridges that would permanently impede the free flow of the river and obstruct whitewater rafting.
- Create a long-term water surface quality impact from bridge maintenance activities while the temporary bridges had only a short-term effect. Sediment

- entering the river from construction activities would remain a temporary effect from the construction of the alternative and the removal of the detour.
- Rock material removal in the amount of 8,300 cubic yards from the northern canyon slope would be required beyond what was originally a temporary dispersal of rock material from the placement of the temporary bridges. Once these bridges are removed, the riverbank contours would be restored to their original condition at that particular location. However, new piers would be constructed within the riverbank.

For Alternative S-2:

- Replace the bridges that are temporarily within the bed and banks of the river with bridges that would no longer impede the free flow of the river or obstruct whitewater rafting.
- Create a long-term water surface quality impact from bridge maintenance activities while the temporary bridges had only a short-term effect. Sediment entering the river from construction activities would remain a temporary effect from the construction of the alternative and the removal of the detour.
- Rock material removal for S2-V1 in the amount of 21,000 cubic yards from the northern canyon slope and 126 cubic yards for S2-V2 would be required beyond what was originally a temporary dispersal of rock material from the placement of the temporary bridges. Once these bridges are removed, the riverbank contours would be restored to their original condition at that particular location. New piers would be constructed above the active bankfull river channel.

For Alternative R:

- Replace the bridges that are temporarily within the bed and banks of the river with a rockshed that eliminates the placement of structures within the riverbank. There would no longer be an impedance of the free flow of the river or an obstruction of whitewater rafting.
- Rockslide talus removal in the amount of 80,000 cubic yards would be required beyond what was originally a temporary dispersal of rock material from the placement of the temporary bridges. Once these bridges are removed, the riverbank contours would be restored to their original condition.
- Remove 2.1 acres of Tompkin's sedge habitat.

For Alternative T-3:

- Replace the bridges that are temporarily within the bed and banks of the river with a tunnel constructed under the rockslide that eliminates the placement of structures within the riverbank. There would no longer be an impediment of the free flow of the river or an obstruction of whitewater rafting.
- Rock material removal in the amount of 292,000 cubic yards would be required beyond what was originally a temporary dispersal of rock material from the placement of the temporary bridges. Once these bridges are removed, the riverbank contours would be restored to their original condition.
- Remove 0.45 acre of Tompkin's sedge habitat.

For the No-build Alternative:

- The temporary bridge abutments constructed adjacent to Incline Road or the former Yosemite Valley Railroad and the pavement along Incline road would have a short-term effect on the appearance of the railroad grade.
- At the Q2 flow, neither of the No-build Alternative bridges would increase the depth of the river when compared to the river in its natural state or without bridges. The No-build Alternative would only produce minor changes in the flow velocity of the river, with slightly higher flow rates in the center of the channel just below the downstream bridge and at the center pier of the upstream bridge.
- The upstream bridge center pier is located along the right side of the river flow as well as on the inside of the bend. The river carries rafters to the outside bend, which prevents rafters from colliding with the pier. For the upstream bridge, rafters would have approximately 100 feet of river in which to safely travel. The No-build Alternative will eventually fail and require removal. The removal of the temporary detour would restore the riverbank to its natural condition, however access for through travelers along this section of State Route 140 would be cut off.
- Surface water impacts from bridge maintenance activities until the eventual removal of the temporary bridges would occur. The removal of the temporary bridges could create potential surface water quality impacts through the increase of sediment.

The cumulative effect on Incline Road for all of the alternatives would be to restore it to its original condition and use as a recreational trail since the emergency project has only temporarily eliminated its function as a trail in order to be used as a detour.

Table 3.1 summarizes the impacts to the Wild and Scenic Merced River.

Table 3.1 Wild and Scenic River Impacts

Potential Impact	Alternative C	Alternative T	Alternative S	Alternative S-2	Alternative R	Alternative T-3	No-build Alternative
Free-Flowing Condition	Would be constructed within Q2 flow of river. Proposed left bank pier location would impede rafting.	Would be constructed within Q2 flow of river. Proposed left bank pier location would impede rafting.	Would be constructed within Q2 flow of river. Proposed left bank pier location would impede rafting.	None	None	None	For river flows exceeding the Q2, the right bank pier would impede rafting.
Water Quality	Short-term impacts to surface water quality could occur during construction from increases in sediment. Long-term impacts could occur from bridge runoff and bridge maintenance activities.	Short-term impacts to surface water quality could occur during construction from increases in sediment. Long-term impacts could occur from bridge runoff and bridge maintenance activities.	Short-term impacts to surface water quality could occur during construction from increases in sediment. Long-term impacts could occur from bridge runoff and bridge maintenance activities.	Short-term impacts to surface water quality could occur during construction from increases in sediment. Long-term impacts could occur from bridge runoff and bridge maintenance activities.	Short-term impacts to surface water quality could occur during construction from increases in sediment.	Short-term impacts to surface water quality could occur during construction from increases in sediment.	Short-term impacts to surface water quality could occur from bridge runoff and bridge maintenance activities. There would be no long-term impacts as the bridges would require removal.
Geology	Would require cutting, blasting, and drilling into rock slope. Minimal excavation for drilling of piers.	Would require cutting, blasting, and drilling into rock slope. Minimal excavation for drilling of piers.	Would require cutting into rock slope for placement of viaduct section. Minimal excavation for drilling of piers.	Would require cutting into rock slope for placement of viaduct section. Minimal excavation for drilling of piers.	Would require removal of rockslide talus.	Would require cutting, blasting, and drilling into area under rockslide.	None
Recreation	Would construct bridge pier in the flow of whitewater rafting. Reestablishes Incline Road as a recreational trail.	Would construct bridge pier in the flow of whitewater rafting. Reestablishes Incline Road as a recreational trail.	Would construct bridge pier in the flow of whitewater rafting. Reestablishes Incline Road as a recreational trail.	Would not impede whitewater rafting and reestablishes Incline Road as a recreational trail.	No impact to whitewater rafting. Reestablishes Incline Road as a recreational trail.	No impact to whitewater rafting. Reestablishes Incline Road as a recreational trail.	Constructed a temporary bridge pier in the flow of whitewater rafting. Would leave Incline Road paved temporarily and eliminate its recreational uses until the bridges and pavement require removal.
Wildlife	None	None	None	None	Would directly remove 2.10 acres of limestone salamander habitat and likely result in a direct take on the animal itself.	Would directly remove 0.45 acre of limestone salamander habitat and likely result in a direct take on the animal itself.	None
Vegetation	Two patches of copper moss would be removed.	Two patches of copper moss would be removed.	One patch of copper moss would be removed.	None	2.10 acres of Mariposa clarkia and Tompkins sedge habitat would be removed. 1.05 acres of Smallflower monkeyflower habitat would be removed.	0.45 acre of Mariposa clarkia and Tompkins sedge habitat would be removed. 0.25 acres of Smallflower monkeyflower habitat would be removed. One to two populations of copper moss would be removed.	None
Cultural/History	None	None	None	None	None	None	The appearance of the Yosemite Valley Railroad Grade is temporarily altered with the presence of pavement and bridge abutments. The removal of these structures would return the railroad grade to its previous condition.

Avoidance, Minimization, and/or Mitigation Measures

Free-Flowing Condition and Water Quality

Because of design limitations, there are no feasible mitigation measures for the effects of Alternatives C, T, and S on the free-flowing condition of the Merced River.

Alternatives S-2, R, and T-3 would not impede the free-flowing condition of the river at the Q2 flow. Mitigation measures would not be required for these alternatives with regards to river flow.

Temporary construction impacts could be minimized through segmental construction of the bridges, which would limit the amount of falsework within the river channel.

Management measures and best management practices would be needed to address any water quality impacts. Best management practices for roads, highways, and bridges include the following:

- Protect areas that provide important water quality benefits or are particularly susceptible to erosion.
- Limit land disturbance such as clearing, grading, cutting, and filling to prevent erosion.
- Limit disturbance of natural drainage features and vegetation.
- Position bridge structures so sensitive and valuable aquatic ecosystems are protected.
- Prepare and implement an approved Storm Water Pollution Prevention Plan.
- Ensure proper storage and disposal of toxic material.
- Incorporate pollution prevention into operation and maintenance procedures.
- Develop and implement runoff pollution controls for existing road systems.

The following pollution prevention measures are being proposed in the design of this project:

- Culverts would discharge surface runoff from the project to unlined channels. To minimize scour (erosion), check dams, drainage inlets, and energy dissipation systems would be incorporated into the drainage design.
- Flared end sections and energy dissipation devices would be constructed at all culvert outlets.
- All ditches would be stabilized with erosion control.
- Embankment slopes would be constructed with a slope of 1:4 or flatter.
- The newly constructed slopes would be stabilized with erosion control.

Geology

There are no feasible mitigation measures for the effects of the rock material removed by each of the build alternatives.

The entrances for both Alternatives R and T-3 would be constructed at least 150 feet away from the flanks of the slide. Placing the entrances at this location would provide adequate distance for more rockfall debris to accumulate without spilling onto the highway and blocking the tunnels. When constructing the entrances, the slopes would be cut at a 1:4 ratio. A catchment area at-grade, rockfall barriers, or a combination of the two would also be required for these alternatives to protect the roadway from potential falling rock.

Recreation

The following measures would be used to minimize the temporary construction impacts to the recreation outstandingly remarkable value:

- During the rafting season, any construction being conducted Monday through Thursday would need to be coordinated with the U.S. Forest Service, Bureau of Land Management, and the commercial outfitters. Spotters would be placed at the rafting put-in locations and upstream from the construction area to identify time periods during which construction would need to be suspended to allow boating to continue through the project area.
- During the rafting season, any construction being conducted Friday through Sunday would need to occur between the hours of 8:00 p.m. and 8:00 a.m. Construction would be suspended during daylight hours except for construction activities that would not impact traffic or involve work in, alongside, or above the river, potentially impeding boating opportunities.
- During the rafting season, construction activities would need to be suspended for a four-day duration surrounding both the Memorial Day and July 4th holidays.
- A minimum of a two-week notice would need to be provided to the U.S. Forest Service, Bureau of Land Management, and the commercial outfitters prior to Caltrans closing the river for any construction activities. Any closure of the river would occur on a Wednesday. An additional 48-hour notification of the specific times that the river would be closed on Tuesday afternoon and when it would be opening to rafting Thursday morning would be required.
- Any road closures would need to be planned in coordination with the U.S. Forest Service, Bureau of Land Management, and the commercial outfitters. Agencies and outfitters would be notified of the closures a minimum of two weeks in

advance of them. An additional 48-hour notice would need to be provided for specific times of planned closures.

- Trail use opportunities would need to be restored at the earliest possible date.

Wildlife

Alternatives C, T, S, and S-2 would require tapering the approaches to the bridges to match the existing highway alignment. This tapering would minimize or avoid cutting into the southern slopes where limestone salamanders have been observed. If cuts were determined to be necessary, construction activities would only be allowed in areas identified as poor to fair habitat.

A construction work window may be established to prevent construction-related activities from occurring on the southern slope during the salamander's active season, December through March. Environmentally sensitive area fencing in the form of 5-foot orange plastic mesh as well as salamander protection fencing in the form of 24-inch sheet metal would be erected if construction-related activities must be pursued adjacent to limestone salamander habitat and during their active season.

Because zero impacts are permitted, there are no feasible mitigation measures for reducing impacts to the limestone salamander from Alternatives R and T-3.

Vegetation

Some individual plants to be affected would be transplanted with the assistance and concurrence of the U.S. Forest Service botanist.

Caltrans biologists and landscape specialists would continue to coordinate with the U.S. Forest Service regarding the planting of appropriate vegetation during and after construction. This may include seed collection from affected Mariposa clarkia plants.

Cultural/History

The build alternatives and eventually the No-build Alternative would remove the existing detour pavement from the Yosemite Valley Railroad Grade (Incline Road) and restore it to natural conditions.

3.1.1.4 Parks and Recreation

Affected Environment

Yosemite National Park is the main tourist attraction of Mariposa County (see Figure 1-1). People from around the world visit the park to sightsee, hike and camp. An

average of 3.4 million people visited Yosemite National Park for recreation each year between 2005 and 2008.

The Sierra National Forest also offers many recreational activities, including hunting, fishing, hiking, swimming, and camping. Incline Road is used as a bicycle, pedestrian, and equestrian trail. Refer to Section 3.1.4 Traffic and Transportation/ Pedestrian and Bicycle Facilities.

Within the project area, the Merced River is used for whitewater rafting. Operating under permit from the Bureau of Land Management, around eight commercial whitewater rafting outfitters provide rafting services on the river. Rafters can rent boats out of El Portal at the Red Bud Picnic Area and Whitewater Rafting Put-in or at the Briceburg Put-in and Take-out areas. Whitewater rafting season runs from April to July, depending on the winter snow pack. Peak flows of the river occur during April and May.

Camping is popular in the Sierra National Forest. The U.S. Bureau of Land Management manages several campgrounds along the Merced River. Three campgrounds below Briceburg—McCabe Flat, Willow Placer, and Railroad Flat—offer both tent and recreational vehicle campsites, however none are within the project area.

Environmental Consequences

Three state highways provide access to Yosemite National Park. State Route 140, which has gentle grades and curves, is one. State Routes 120 and 41 are the other two, but they both have steeper grades and tighter curves than State Route 140 and are difficult to maneuver with larger vehicles, especially during the winter months. The Ferguson rockslide temporarily eliminated State Route 140 as the most accessible route for tour buses, which brings buses into Yosemite National Park through the Arch Rock entrance. With the reconstruction of the emergency project, tour buses were able to access recreational activities along the highway and Yosemite National Park via State Route 140, however the access is considered to be temporary.

The build alternatives would allow visitors and recreational users full access to Yosemite National Park, Sierra National Forest, and whitewater rafting opportunities. The No-build Alternative requires the eventual closure of the highway and prevents recreational vehicles and tour buses from accessing all recreational activities, including visiting Yosemite National Park, by way of State Route 140.

The Merced River is designated as a Wild and Scenic River and protected by the Wild and Scenic Rivers Act (refer to Section 3.1.1.3). The Merced River is also considered a recreational resource and protected by Section 4(f) of the Department of Transportation Act of 1966. The 4(f) evaluation, which is prepared in conjunction with cooperating agencies, can be found in Appendix B.

Cumulative Impacts

Since the No-build Alternative is the result of the emergency project, the cumulative effect of this alternative would be the eventual failure of the temporary structures, with motorists being restricted to other routes when trying to access recreational activities and Yosemite National Park. The build alternatives propose to restore full access as State Route 140 and would not have a cumulative effect.

Avoidance, Minimization, and/or Mitigation Measures

For the build alternatives, see Avoidance, Minimization, and/or Mitigation Measures in Section 3.1.1.3.

There are no feasible avoidances, minimizations, and/or mitigation measures for the effects of the No-build Alternative.

3.1.2 Community Impacts

3.1.2.1 Community Character and Cohesion

Regulatory Setting

The National Environmental Policy Act of 1969, as amended, established that the federal government use all practicable means to ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings [42 U.S. Code 4331(b)(2)]. The Federal Highway Administration in its implementation of the National Environmental Policy Act [23 U.S. Code 109(h)] directs that final decisions regarding projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as, destruction or disruption of human-made resources, community cohesion, and the availability of public facilities and services.

Under the California Environmental Quality Act, an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant.

Since this project would result in physical change to the environment, it is appropriate to consider changes to community character and cohesion in assessing the significance of the project's effects.

Affected Environment

A Community Impact Assessment was completed in July 2007, and an Economic Impact Report was completed on May 25, 2007. Mariposa County is an international destination because of Yosemite National Park. Every year, millions of visitors come to Yosemite. Visitors can enter the park in a passenger vehicle or as part of a bus tour.

Communities

Communities in the affected area include Mariposa, Midpines, and Briceburg on the west side of the rockslide and Yosemite Village and El Portal on the east side of the rockslide. Mariposa is the largest town in the county and supports the county's greatest amount of tourist accommodations. El Portal is a high-density residential area, with a business and resort center near the entrance to Yosemite National Park. Midpines is a residential area that surrounds a small commercial center minutes east of Mariposa. Yosemite Village has the second largest population in the county. Yosemite Village houses employees of the park as well as individuals who provide services for the park.

Schools and Childcare Facilities

A number of schools and childcare facilities serve the Mariposa County area. Childcare facilities include the Almost Like Home Before and After Schooling Center, the Mariposa Children's Center, Mariposa County Head Start, Mariposa Lutheran Childhood Discovery Program, the El Portal Child Development Center, and the Yosemite Valley Daycare Center. Schools in the Yosemite area include Yosemite Valley School, El Portal Elementary School, and Yosemite Park High School. The Mariposa area schools include Mariposa High School and Mariposa Elementary School. Many children live in one community but attend schools or childcare facilities in other communities, adding urgency to the need for access between the communities.

Economy and Jobs

Because State Route 140 provides a direct all-weather route to Yosemite Valley, the communities along State Route 140 serve as hosts to thousands of tourists a year. The Mariposa County economy is described mainly as a service-providing economy, with

most of its employment in accommodations, government services, retail trade, and food service establishments.

More than half of the private economic activity and private sector jobs in Mariposa County support tourism, mainly visitors on their way to and from Yosemite, and a large share of governmental expenditures relate to tourism, as well. The economy has typically been affected by the seasonal fluctuation of tourism. During the summer months, more tourists visit the area, increasing seasonal job opportunities. During the winter months, tourism and jobs tend to decrease. While there is a core economy in Mariposa that serves the local residents, businesses, and government employees, the main economic driver in Mariposa County is tourism and the businesses that support it.

State Route 140 is essential for supplying goods and services to the different communities throughout the Mariposa and Yosemite National Park area. State Route 140 is the basis of the cohesiveness between area communities.

Environmental Consequences

Immediately after the Ferguson rockslide, businesses in the communities along State Route 140 began suffering economic losses from the diversion of tourist traffic. Even with the original temporary detour in place, the 28-foot vehicle length restriction prevented tour bus companies from bringing many visitors to the area.

Tour bus companies, which carry loads of tourists to the area, were forced to take different routes to the entrance to Yosemite, bypassing the communities along State Route 140. The companies stopped renewing contracts that use State Route 140 as a way of getting to tourist attractions. For additional information on tour buses, see Section 3.1.4.

These ongoing effects caused a sharp drop in the local economy, presenting the possibility of a further economic emergency that might not be survivable for some communities. In response, Caltrans, regulatory agencies, and Mariposa County officials worked on a second temporary solution that allowed vehicles up to 45 feet long to use the slide detour on State Route 140. The purpose of the new detour, which opened in June 2008, was to allow tour buses to safely travel on State Route 140.

The No-build Alternative would eventually be eliminated due to eventual failure of the temporary bridges or their support. The failure of the No-build alternative would eliminate through access for motor vehicle traffic at the Ferguson Rockslide and

between communities along State Route 140, keeping children from being transported to schools, making service-providers unable to accept work from the next town over, and eliminating tourism through the communities by way of State Route 140.

The build alternatives would provide full access throughout the communities and to tourist attractions, which is important in maintaining community stability and family and school district cohesion. Tour buses and the tourists themselves could continue to enter Yosemite via State Route 140, supporting the Mariposa County economy and its tourism-related businesses.

Community cohesion would be maintained as goods and services could efficiently be supplied between the communities. In addition, school buses would no longer be affected by time delays caused by the temporary detour.

Cumulative Impacts

Since the No-build Alternative is the result of the emergency project, the cumulative effect would be the eventual failure of the temporary structures, with motorists being restricted to other routes when trying to access different communities whether for jobs, schooling, or to obtain goods. The build alternatives propose to restore full access along State Route 140 and would not have a cumulative effect.

Avoidance, Minimization, and/or Mitigation Measures

The build alternatives would maintain community cohesion and therefore not require any avoidance, minimization, and/or mitigation measures.

There are no feasible mitigation measures for the long-term effects of the No-build Alternative.

3.1.3 Environmental Justice

Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in *Minority Populations and Low-Income Populations*, signed by President Bill Clinton on February 11, 1994. This Executive Order directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low

income is defined based on the Department of Health and Human Services poverty guidelines. For year 2009, this was \$22,050 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. The Department's commitment to upholding the mandates of Title VI is evidenced by its Title VI Policy Statement, signed by the Director, which can be found in Appendix C of this document.

Affected Environment

The Community Impact Assessment (July 2007), which was prepared by Caltrans, identified areas throughout the communities of Mariposa, El Portal, Midpines, and Yosemite Village where approximately 20% of Mariposa County's population is living with incomes below the poverty level. The ethnicity of individuals residing throughout these communities is predominately White persons at 87% of the County's population, Black persons at 0.06%, American Indian and Alaska Native persons at 6.3%, Asian persons at 0.09%, and Hispanic or Latino persons at 5.8%. Minority and low-income populations have been identified using 2000 Census data.

There are no residences in the project area, and the nearest residences are within a mile away.

Environmental Consequences

If there are low-income and minority populations near the project area, these populations as well as the entire population of the county would equally experience beneficial impacts as a result of this project. Those beneficial effects include:

- Vehicular access to communities throughout the county, Yosemite National Park, and recreational activities, which is temporarily limited, would be restored to full.
- Improved transit to jobs and schools would end current delays as well as improve response times for utility and emergency vehicles.
- Improved access to trails and paths would be restored for pedestrians and cyclists.

The No-build Alternative would be eliminated due to eventual failure of the temporary bridges or their support. The failure of the No-build alternative would eliminate through access for all motorists traveling State Route 140.

Based on the above discussion, the proposed project would not cause disproportionately high and adverse effects on any minority or low-income populations as discussed in Executive Order 12898 regarding environmental justice.

Avoidance, Minimization, and/or Mitigation Measures

No mitigation measures would be required.

3.1.4 Utilities/Emergency Services

Affected Environment

Caltrans prepared a Community Impact Assessment (July 2007) for the proposed project.

Law Enforcement

The Mariposa County Sheriff's office is the primary law enforcement agency for Mariposa County, including federally owned lands. The Sheriff's office provides such services for the county as coroner/public administrator, animal control, search and rescue, boating and safety on county waterways, civil service, court security, corrections, and emergency 911 dispatch. The Sheriff's office also provides limited services for Yosemite National Park, although the park has its own law enforcement unit. The California Highway Patrol is responsible for traffic enforcement and accident investigation along the highways in the county. The U.S. Forest Service operates the Bass Lake Ranger Station located in North Fork. This ranger station has jurisdiction over the project area and is responsible for enforcement of federal laws and regulations governing national forest lands and resources.

Fire Protection

The California Department of Forestry operates five fire stations in Mariposa County, one of which is located in the town of Mariposa. The Yosemite Fire Department provides wildland and structural fire protection and responds to hazardous material spills, emergency medical calls, searches and rescues, public service, and motor vehicle accidents. The Yosemite Fire Department provides these services to Yosemite Valley, Wawona, El Portal, and other areas of Mariposa County. The Mariposa Public Utility District Fire Department has been providing fire protection to the historic district of Mariposa. This fire department would also provide and receive aid to and from the Mariposa County Fire Department and the California Department of Forestry.

Hospitals

West of the rockslide, the John C. Fremont Hospital District operates as a countywide independent district. The hospital is located in Mariposa and provides a clinic, an extended-care facility, in-patient beds, 24-hour trauma services, and a helicopter for emergency air transport. East of the rockslide, the National Park Service contracts with Doctors Medical Center for medical services within Yosemite National Park at the Yosemite Medical Clinic. This clinic is able to treat minor injuries and medical conditions and provide first aid for incidents occurring within the park and the El Portal area. Larger medical emergencies must be handled by the John C. Fremont Hospital on the other side of the rockslide.

Utilities

There are underground AT&T telephone facilities and Pacific Gas and Electric overhead power facilities within the project area.

Environmental Consequences

The No-build Alternative provides short-term access for emergency services with minimal delay (up to 15 minutes) resulting from passing through the single-lane detour. The failure of the temporary structures would eventually close the highway, diminishing access for emergency service vehicles and equipment to the east side of the rockslide where additional or specialized services would be needed in the local communities. It may also diminish access to specialized medical care for those residents forced to drive 2.5 hours out of their way to get to the hospital in Mariposa.

All the build alternatives offer full access for emergency services, specifically access to the John C. Fremont Hospital, which offers the only large-scale medical care in the county. Law enforcement and fire services have been established on both sides of the rockslide, however these services would experience unrestricted access (without the delay of up to 15 minutes) with the build alternatives should the need for additional services from other areas occur. There would be short-term closures and delays for construction operations such as blasting for the viaduct and tunnel openings along Incline Road. Closures of the detour would also occur during the erection and removal of falsework. No long-term closures are anticipated for the build alternatives. Refer to Section 3.6 for details on construction methods.

No utility relocations are anticipated.

Cumulative Impacts

Since the No-build Alternative is the result of the emergency project, the cumulative effect would be the eventual failure of the temporary structures, which eliminates timely access to the John C. Fremont Hospital for individuals residing or working on the east side of the rockslide. Specialized or additional emergency service vehicles and equipment located on one side of the rockslide but needing to access the other would be cut off and restricted to using other routes. The build alternatives propose to restore full access along State Route 140 and would not have a cumulative effect.

Avoidance, Minimization, and/or Mitigation Measures

For the No-build Alternative, the existing signal lights at the entrances and exits of the detour are designed to flash during an emergency situation. The flashing signals would allow emergency vehicles to pass through the temporary detour with minimal delay.

3.1.5 Traffic and Transportation/Pedestrian and Bicycle Facilities

Affected Environment

The Ferguson rockslide is blocking the section of State Route 140 that links the town of Mariposa to Yosemite National Park. Currently, the temporary detour serves the purpose of maintaining essential traffic through the area blocked by the rockslide. Yosemite National Park and the communities of Mariposa County rely heavily on full access along this highway for many types of transportation that serve tourists to and residents of the area.

Transit

Public transit systems use State Route 140 to transport people through Mariposa County and Yosemite National Park. The VIA-Adventures Tour Service operates 45-foot-long buses between the City of Merced and Yosemite Valley via State Route 140. Yosemite Area Regional Transportation System, known as YARTS, is another service that provides inter-county transit to Yosemite National Park. It is designed to provide an alternative mode of transportation for both visitors and employees of Yosemite National Park.

Buses

The main vehicle for tourism is the tour bus. These buses are usually about 45 feet long, and they are easier to maneuver along roads like State Route 140 with relatively minor curves and flatter surfaces to avoid accidents and delays. Tour buses also

deliver tourists to businesses providing lodging, food and drink, and retail goods while on the way to Yosemite National Park.

Pedestrian and Bicycle Facilities

There are no designated pedestrian and bicycle facilities in the project area. However, bicyclists and pedestrians use the highway's shoulders or edge of the road, and Incline Road serves as a hiking and bicycle trail.

Environmental Consequences

The build alternatives would accommodate all vehicles by restoring full access on State Route 140. There would be a short-term impact on access due to the construction of a build alternative. Impacts from the construction of the build alternatives would be temporary and would require minimal closures of the highway as traffic would be maintained throughout construction on the temporary detour. Construction activities such as excavation and falsework construction would occur within the river channel.

The No-build Alternative, which controls traffic through signal lights and has a 45-foot vehicle length restriction, relies on bridge support structures with a service lifespan of 5 to 10 years. When these temporary bridges fail, the highway will close, cutting off through access between Mariposa and El Portal permanently. This impact would place a severe hardship on businesses and residents of Mariposa County.

The proposed project would restore the recreational use of Incline Road by returning the trail to its natural condition. At the request of the National Park Service and the U.S. Forest Service, all of the build alternatives would maintain access to Incline Road for pedestrians and bicyclists or other recreational users. All pavement used by the temporary detour would be removed. The No-build Alternative would eliminate the recreational use of Incline Road throughout the life of the temporary detour.

Although they do not include designated bicycle lanes, the build alternatives would provide 8-foot-wide shoulders in both directions allowing access for bicyclists along this section of State Route 140. The No-build Alternative is a one-lane roadway with no shoulders, offering no safe access for bicyclists.

Cumulative Impacts

Since the No-build Alternative is the result of the emergency project, the cumulative effect would be the eventual failure of the temporary structures, which cuts off State Route 140 to through traffic and eliminates the link between Mariposa and Yosemite

National Park. Access for pedestrians and bicyclists would also be cut off through this section of the highway. The build alternatives propose to restore full access along State Route 140 and would not have a cumulative effect to traffic and transportation systems.

Avoidance, Minimization, and/or Mitigation Measures

There would be no feasible avoidance, minimization, and/or mitigation measure for the effects of the No-build Alternative.

During construction of any of the build alternatives, a Traffic Management Plan would accommodate traffic on the existing temporary detour. The Traffic Management Plan would include:

- Limited short-term closures and night and weekend work with the roadway closures confined to a series of two-hour work windows
- Construction staging

Public notification advertising the dates and location of the construction would be provided through media press releases, local cable and news broadcasts, a project web page, and the Caltrans Public Information Office. Message and special construction signs, plus highway advisory radio, would inform motorists traveling through the construction zone. The Construction Zone Enhanced Enforcement Program would also be used. This program improves project safety through the use of supplemental California Highway Patrol units that assist in the management of traffic going through the construction zone.

3.1.6 Visual/Aesthetics

Regulatory Setting

The National Environmental Policy Act of 1969, as amended, establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings [42 U.S. Code 4331(b)(2)]. To further emphasize this point, the Federal Highway Administration in its implementation of the National Environmental Policy Act [23 U.S. Code 109(h)] directs that final decisions regarding projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

Likewise, the California Environmental Quality Act establishes that it is the policy of the state to take all action necessary to provide the people of the state “with...enjoyment of *aesthetic*, natural, scenic and historic environmental qualities.” [CA Public Resources Code Section 21001(b)]

Affected Environment

A Visual Impact Assessment was completed in April 2009 for the project.

The land in the project area is primarily steeply rolling hills supporting a mixed oak woodland forest. This forest is made up of oak trees and pine trees ranging from seedlings to adult trees. Pines generally grow on the drier south- and west-facing slopes with the oak trees growing on the north- and east-facing slopes. The ground is a mix of low broadleaf evergreen shrubs and grasses. Rock outcroppings are common.

The existing highway, Incline Road grade, and the electric transmission lines are the primary human-made elements in the project area. The roadway and associated cut slopes parallel the Merced River. The steep slopes and winding nature of the river confine the views of roadway travelers, river users, and recreational trail users. Roadway travelers are composed of tourists, sightseers, recreational users, local residents, work commuters, commercial and service-related travelers, and often bicyclists. River users are rafters and kayakers and people fishing from the river bank. Trail users include hikers, bicyclists, and horseback riders using Incline Road.

State Route 140 is designated as a Scenic Highway from its junction with State Route 49 in Mariposa to Yosemite National Park. The intent of the California Scenic Highway Program is to protect and enhance the natural scenic beauty of the highways by means of special conservation treatments. The segment of the Merced River that flows through the project area has been designated as a Wild and Scenic River and classified as recreational. This classification does not prevent development along the river, but requires the protection and enhancement of the values for which the river was designated.

Criteria used to describe the visual character of the project area include the following:

- Vividness or the memorable strength of the landscape components as they combine in a distinctive visual pattern.
- Intactness or the visual integrity of the landscape and its freedom from non-typical encroaching elements.

- Unity or the visual harmony of the landscape considered as a whole.

The overall visual quality of the landscape within the Merced River Canyon (free of structures) is high with high vividness and unity and moderately high intactness, because of the aesthetic appeal of the vegetated slopes and the patterns created between the vegetation and the rock outcroppings. However, existing conditions with the temporary bridges and detour in place define the project area as having a moderately high overall visual quality. The overall visual quality is measured by averaging the vividness, intactness, and unity.

Environmental Consequences

Table 3.2 summarizes the overall visual quality assigned to each of the alternatives as they affect the driver, the river user, and the trail users. A description of each alternative's visual quality as it affects those users is explained below. Simulations of proposed views are shown in Figures 3-1 through 3-15.

Table 3.2 Visual Quality of Alternatives as Compared to Existing Environment

User Type	Visual Quality of Canyon (free of structures)	C	T	S	S2-V1	S2-V2	R	T-3	No-build
Driver	High	Moderate	Moderate	Moderately High	High	High	Moderate	Moderately High	Moderately High
River	High	Moderately High	Moderately High	Moderate	Moderately High	Moderately High	Moderately Low	High	Moderately High
Trail	High	Moderately High	Moderately High	Moderate	Moderately High	High	Moderately Low	High	Moderately High

Alternative C

From the driver’s perspective, the concrete bridges and roadway would sit higher in the landscape, offering new views farther into the distance and along the river course.

The cut slopes between the two bridges would add an engineered look to the landscape that would be most noticeable from drivers approaching the area. Because of the steepness of the cuts, the establishment of vegetation would be limited to grasses, which would not substantially soften the rock cuts. The proposed roadway with its wide shoulders and rockfall areas would be much wider than the existing roadway section. The shoulders of the current roadway are much narrower, in the 2- to 3-foot range, with wider pullout areas where the topography allows. The effect of the bridges and the cut slopes would be to reduce the visual quality of the immediate area from moderately high to moderate.

For rafters and people along the banks of the river, the bridges along with their associated abutment walls would be the most noticeable, however they would be high enough to leave views open along the river. The full effect of the cut slope would only be seen from certain points along the river, but as with the driver’s view, the cut would detract from the surrounding natural hillside. The river user’s visual quality would be maintained at a moderately high rating with the addition of the concrete bridges.

For the trail users, the most notable visual difference would be where the bridges cross over Incline Road and possibly the abutment walls. It would be unlikely that trail users would see the cut slope since they are at the base of the slope. The trail

user's visual quality would be maintained at moderately high as the bridges overhead would block views of the canyon slopes.

Alternative T

As with Alternative C, the driver would cross the river on concrete bridges that sit higher in the landscape, which offers new views farther into the distance and along the river course. These new views would be limited to the bridge areas only; as drivers approach and enter the tunnel, the views of the surrounding scenery would be blocked. Views within the tunnel would be strictly of the tunnel walls themselves, which the tunnel itself is a new visual element. Because the tunnel walls block views of the landscape, the visual quality would decrease from moderately high to moderate.

For rafters and people along the banks of the river and as with Alternative C, the bridges and associated structures would be the most noticeable element, however their height would leave views open along the river. Because the tunnel section does affect the northern slope, river users would only have brief views of the tunnel portals along with their retaining walls. The tunnel portals would be a new element along the river and along with the bridges would maintain the visual quality at moderately high.

For the trail users, the most notable visual difference would be where the bridges cross over Incline Road and possibly the abutment walls. It is unlikely that trail users could see the tunnel portals. The bridges would maintain the visual quality at moderately high.

Alternative S

From the driver's perspective, the concrete bridges and roadway would sit higher in the landscape, offering new views farther into the distance and along the river course. The roadway portion between the two bridges or viaduct section would include a cut slope up to 25 feet tall and would be noticeable by the driver at least at the base of the cut. The entire cut would not be seen since the roadway would be in close proximity and the view would be limiting. The cut would look engineered and, because of its steepness, woody vegetation would not be able to establish itself. Based on the cut element, the visual quality of the area would be maintained at moderately high.

For river users, views of the structures would be more intrusive since the bridges themselves are longer and contain the viaduct and retaining wall section, also noticeable by anyone using the river. The obtrusiveness of the retaining wall could be

reduced through the preservation of the slope and natural rock formations and any vegetation placed in front of the wall. The visual quality would still be reduced from moderately high to moderate.

Trail users would experience blocked views from bridges passing over Incline Road and a view of the new retaining wall that would parallel Incline Road. The cut slope above the roadway would most likely not be seen by trail users, however the retaining wall would be very noticeable as it runs 360 feet along the trail. The visual quality for trail users would also be reduced from moderately high to moderate.

Alternative S2 (Variations S2-V1 and S2-V2)

Variation S2-V1 has some of the same impacts as Alternative S. The differences in the impacts from S2-V1 are more dramatic as the bridge type changes to a tied-arch. These bridges require a greater distance to span, so they would be longer and the arched portions of the bridges could reach up to 130 feet high. Given that many of the existing bridges along other segments of State Route 140 were developed in the 1930s and 1940s, the design of a tied-arch bridge appears to better fit within the existing environment than a smooth concrete structure. The use of this type of bridge architecture would be anticipated to enhance the overall aesthetics of the project area with its historic image.

The tied-arches would be very noticeable to drivers because of their height within the landscape. Although these bridges are tall, they would have a lighter visual presence in that a thinner bridge deck could be used creating a less bulky concrete appearance. The viaduct section is longer with this variation as it extends to 510 feet, thus lengthening the driver's view of the cut slope. Because of the tied-arches historical context and their lighter appearance, the moderately high visual quality of the area would be improved to high.

For the river users, the tied-arches would also be very noticeable in both their heights and greater river spans. The retaining wall would be a very prominent feature to the river user as well because of its overall length and placement on the slope, which allows the engineered cut to be viewed. Trail users are anticipated to experience the same impacts as the river user except they would not be able to notice the cut section. The visual quality would be maintained at moderately high for both types of users.

Variation S2-V2 differs from S2-V1 in that it uses slant-leg bridges rather than tied-arch bridges, and the retaining wall would only be 65 feet in length, which reduces

the cut on the northern slope substantially. The slant-leg bridges, although not historic in nature, would place an iconic structure within the landscape. It is anticipated that this bridge shape would enhance the visual quality of the area. The structure is open above the bridge deck, allowing drivers open views of the surroundings. The cut on the slope would only briefly be seen as the motorists drive by. The visual quality would be improved to high.

For river users, the slant-leg bridges would represent a dramatic element over the river. However, the viaduct section would be substantially shorter and disturb less of the landscape on the slope. The visual quality would be maintained at moderately high because of the presence of the wall and its associated cut slope.

The trail user would experience bridges passing overhead but, because of the much shorter retaining wall, the visual quality would be improved to high.

Alternative R

For the approaching driver, the 760-foot-long tunnel along with its entrance walls would be a new element in the landscape. As the driver passes through the tunnel, all views of the outside scenery would be blocked. The blocking of the outside scenery and the view of an exposed rockshed wall by approaching drivers would decrease the visual quality from moderately high to moderate.

For river users and especially rafters, the 15- to 20-foot-high rockshed walls would be very noticeable as the river flows toward and then passes by the roadway alignment. The benefit is that there would be no bridges to block views over the river. For trail users, views of the rockshed wall would be very similar to that of the river user, except that certain trees or other vegetation may obscure some portions of the wall. Given the presence of the exposed rockshed wall, the visual quality would drop from moderately high to moderately low for both users.

Alternative T-3

Much like with Alternative R, the driver would see new elements such as the entrance walls and the tunnel walls. This tunnel is much longer though, at 2,200 feet, and all views of the outside landscape would be blocked as the tunnel curves under the rockslide. Since the tunnel entrance walls would be the only outside visible feature, the visual quality would be maintained at moderately high.

River and trail users alike would notice the entrance walls to the tunnel, especially as the river flows and trail winds northwest and directly toward one of the entrances. It

is anticipated that these entrance walls would not have a substantial presence within the much larger canyon wall. This alternative also has the benefit of no bridges that would block views over the river. The visual quality is expected to improve to high.

No-build Alternative

For drivers, river users, and trail users, the temporary bridges, guard-rail, detour pavement, and signal lights define the project area as having a short-term visual quality of moderately high. The minimal disturbance to the surrounding vegetation has softened the appearance of the engineered elements such as the bridges, but they do not visually fit within the surrounding landscape. With the eventual failure of the temporary bridge structures, their removal will be required. The engineered elements would be removed from the landscape, and the scenery would be restored to its naturally high rating.

Cumulative Impacts

Since the No-build Alternative is the result of the emergency project, the cumulative effect would be the eventual failure of the temporary structures, with the temporary bridges, guard-rail, detour pavement, and signal lights all being removed and the restoration of the landscape to a naturally high rating.

Alternatives C and T would replace metal bridges with concrete bridges and create a cut or tunnel in the undisturbed northern slope. The cumulative effect would be to leave the scenic quality of the area unchanged and retain a moderately high rating. Alternative S would replace metal bridges with concrete bridges and disturb the northern slope with a viaduct. The cumulative effect would be to reduce the scenic quality of the area to moderate. Alternatives S2-V1 and S2-V2 would also replace the temporary bridges with other types of bridges and construct viaduct sections on the northern slope, however the cumulative effects would be different as S2-V1 would retain a moderately high quality and S2-V2 would improve the overall quality to high as the disturbance to the northern slope would be in the form of a 65-foot-long viaduct. S2-V1 proposes a viaduct section that is 510 feet long.

Alternative R would cumulatively lessen the scenic quality to moderately low since a rockshed wall would take the place of the bridges and be exposed to all of the types of viewers. Views from within the tunnel to the outside landscape would also be blocked. Alternative T-3 cumulatively increases the scenic quality to a high rating since the tunnel structure except for the entrance walls would be hidden beneath the rockslide. Views of the outside scenery would be blocked while traveling through the

tunnel, however the tunnel replaces the temporary bridges, resulting in a landscape free of structures.

Avoidance, Minimization, and/or Mitigation Measures

With the implementation of mitigation measures, the visual impacts of this project would be reduced and would not result in substantial changes in scenic quality. The mitigation measures would further avoid affecting the designation of State Route 140 as a Scenic Highway. The following mitigation measures apply to all of the build alternatives and would maintain the visual quality of the area if the project were built:

- During project development, create an aesthetic design advisory committee to include Caltrans context sensitive solutions and recommend measures to refine project aesthetics already determined in concept and listed below.
- Provide an on-site landscape architect during construction to oversee tree and landscape preservation, structural aesthetic applications, and replanting the project area.
- Avoid long, straight, obviously engineered cuts where possible. Warp constructed cut slopes or use variable slope grades to preserve existing trees and break up large cut slopes.
- Round toes and tops of slopes to create a more natural appearance.
- Excavate areas using measures that preserve roots of adjacent trees.
- Retain existing rock outcroppings.
- Create a natural appearance to any rock outcropping exposed by construction and stain to give a weathered look.
- Roughen new slopes to create the look of age.
- Apply erosion control to all disturbed slopes except rock outcroppings and prevent runoff into the river.
- Remove existing roadway paving, barriers, and other elements associated with unused portions of State Route 140.
- Salvage, stockpile, and replace topsoil and duff containing seeds and organic matter from affected areas. Exposed slopes would receive a minimum of 4 inches of topsoil.
- Replace plant materials in specific areas to visually mitigate for structure heights and cut slopes. Consult with the U.S. Forest Service on a planting ratio.
- Replant using native species and create natural-appearing patterns.
- Implement a three-year plant establishment period during which supplemental irrigation will be provided to new plants.

- Restore Incline Road to its natural condition by removing all pavement and temporary bridge abutments.
- Place bridge piers as far as structurally possible from the Q2 boundaries of the river channel.
- Keep the bridge decks as visually thin as possible.
- Allow for at least 10 feet of clearance between Incline Road and the bridge deck.
- Minimize the heights and massiveness of the bridge abutments so the structures appear to flow out of the landscape.
- Provide texture on all exposed walls.
- Concentrate on the overall architecture of the bridge and avoid overt ornamentation. Use jointing, shadow patterns, rust lines, and angular surfaces.
- Use colors on structures that blend into the surroundings.
- Use an open railing on the structures to increase the view of the scenery and reduce the thickness of the bridge.
- Use darkened metal elements or non-reflective surfaces for guard rails and posts.



Figure 3-1 Alternatives C and T Bridge View



Figure 3-2 Alternative C Side View



Figure 3-3 Alternative T Side View



Figure 3-4 Alternative T Tunnel Entrance View

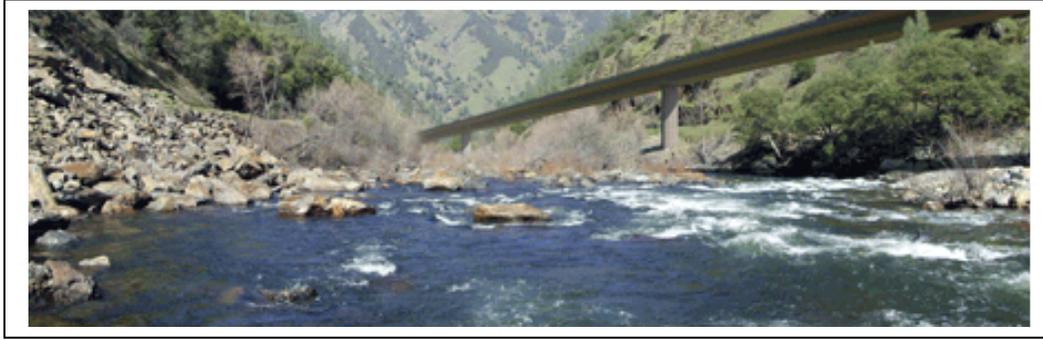


Figure 3-5 Alternative S Bridge View



Figure 3-6 Alternative S Side View



Figure 3-7 Alternative S Trail View



Figure 3-8 Alternative S2-V1 Bridge View



Figure 3-9 Alternative S2-V1 Side View



Figure 3-10 Alternative S2-V1 Trail View

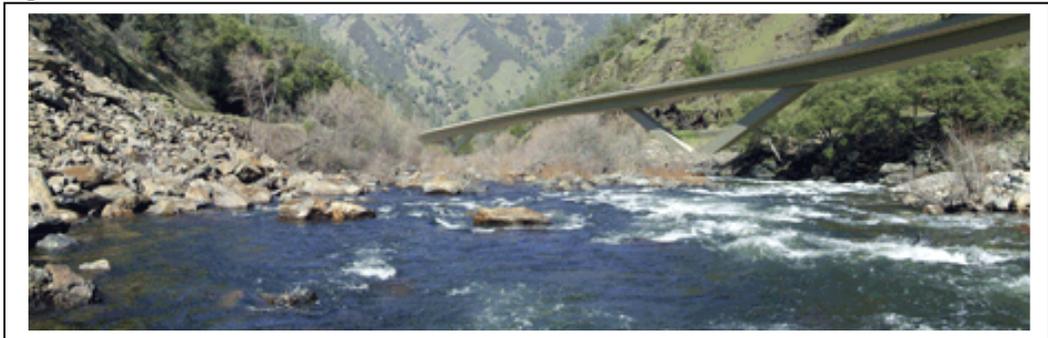


Figure 3-11 Alternative S2-V2 Bridge View



Figure 3-12 Alternative S2-V2 Trail View



Figure 3-13 Alternative R Tunnel Entrance View



Figure 3-14 Alternative R Side View



Figure 3-15 Alternative T-3 Tunnel Entrance View

3.1.7 Cultural Resources

Regulatory Setting

“Cultural resources” as used in this document refers to all historical and archaeological resources, regardless of significance. Laws and regulations dealing with cultural resources include the following.

The National Historic Preservation Act of 1966, as amended, sets forth national policy and procedures regarding historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places. Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 Code of Federal Regulations 800). On January 1, 2004, a Section 106 Programmatic Agreement among the Advisory Council, the Federal Highway Administration, the State Historic Preservation Officer, and Caltrans went into effect for Caltrans projects, both state and local, with Federal Highway Administration involvement. The Programmatic Agreement implements the Advisory Council's regulations, 36 Code of Federal Regulations 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The Federal Highway Administration's responsibilities under the agreement have been assigned to Caltrans as part of the Surface Transportation Delivery Pilot Program (23 Code of Federal Regulations 773) (July 1, 2007).

The Archaeological Resources Protection Act applies when a project may involve archaeological resources located on federal or tribal land. This act requires that a permit be obtained before excavation of an archaeological resource on such land can take place.

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the "use" of land from historic properties. See Appendix B for specific information regarding Section 4(f).

Historical resources are considered under the California Environmental Quality Act, as well as California Public Resources Code Section 5024.1, which established the California Register of Historical Resources. Section 5024 of the Public Resources Code requires state agencies to identify and protect state-owned resources that meet listing criteria for the National Register of Historic Places. It further specifically requires Caltrans to inventory state-owned structures in its rights-of-way.

Affected Environment

An Archeological Survey Report was completed for the project in June 2007. A Historic Resource Evaluation Report was completed in August 2007. And a Historic Property Survey Report was completed in September 2007.

The area of potential effects encompasses all of the ground disturbance and development activities proposed by the build alternatives. The area of potential effects is defined on the south by the slope immediately above State Route 140, on the north side 1,400 to 1,650 feet above Incline Road, in the west at post mile 42.0, and in the east at post mile 42.7. Caltrans conducted record searches and field surveys within the area of potential effects to identify cultural resources.

Archaeology

Caltrans previously surveyed the project area for archaeological resources following severe storm damage to State Route 140 in 1997. During that survey, two archaeological sites were recorded within the current project area. The sites are prehistoric bedrock mortar and historic concrete bridge piers and debris. The bedrock mortar site is considered eligible for the National Register of Historic Places for purposes of the current project only with avoidance measures established to ensure protection of this site from the effects of project activities. The concrete piers were determined not to be eligible for inclusion on the National Register of Historic Places.

Architectural History

Following the Ferguson rockslide in 2006, Caltrans conducted emergency surveys and identified resources that would be affected by the emergency detour and the proposed permanent restoration of State Route 140. These resources include the Yosemite Valley Railroad Grade, Jenkins Hill Trail, and State Route 140.

Each of the three linear resources—the Jenkins Hill Trail, the Yosemite Valley Railroad, and State Route 140—are tens of miles in length, and only short segments of each resource is present within the project area. All three are associated with periods of historic development within the Merced River Canyon: (1) the Jenkins Hill Trail was part of a network of trails and roads that was vital to the mining of the area in the later 1800s; (2) the Yosemite Valley Railroad operated from 1907 to 1945, providing access for tourists to Yosemite National Park and exploitation of natural resources by commercial mining and lumber operations; and, (3) the “All Weather Highway,” constructed from 1923 to 1927, provides year-round access to Yosemite National Park and is associated with the first use of convict labor to construct public roadways in California. However, the portions of these resources that are within the project area lack the integrity of materials, setting, feeling, or design for their respective periods of significance: (1) the Jenkins Hill Trail segment is intermittent, with portions obliterated by slope wash; (2) the rails and ties of the Yosemite Valley Railroad were pulled-up and sold with the rest of the equipment in 1946, and flooding

in 1955 and 1997 washed away portions of the grade; and, (3) the highway, despite being on its original alignment, was damaged by flooding in 1937 and 1997 and is presently covered by the recent rockslide that deposited millions of tons of rubble onto its surface.

The Merced River is designated as a Wild and Scenic River and protected by the Wild and Scenic Rivers Act (refer to Section 3.1.1.3). The Merced River is also considered a recreational resource and protected by Section 4(f) of the Department of Transportation Act of 1966. The 4(f) evaluation, which is prepared in conjunction with cooperating agencies, can be found in Appendix B.

Environmental Consequences

The build alternatives and the No-build Alternative would not alter the condition of the bedrock mortar site.

The six board-formed concrete piers are all that remain of the suspension footbridge within the project area. Thus, the physical integrity of the original suspension bridge is missing and could not be altered by the project alternatives.

The portions of the Yosemite Valley Railroad, the Jenkins Hill Trail, and State Route 140 within the project area were determined to have no potential to contribute to the National Register of Historic Places eligibility of their respective resources as a whole, even if those resources were found to be eligible for inclusion on the National Register of Historic Places. The evaluation did not consider the potential for these resources to be eligible as individual properties nor as contributors to an historic district. Thus, the build alternatives and the No-build Alternative would not alter any significant qualities of these already-compromised segments of the resources.

Caltrans consulted with the State Historic Preservation Officer on the cultural resources determinations without objection per stipulation VIII.c.5 of 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. The State Historic Preservation Officer was notified that under the authority of the Federal Highway Administration, Caltrans has determined a Finding of No Adverse Effect with Standard Conditions. The conditions are discussed below under Avoidance, Minimization, and/or Mitigation Measures. The California State Historic Preservation

Officer concurred with Caltrans' findings on October 10, 2007 (see Appendix D for concurrence letter).

Cumulative Impacts

Since the No-build Alternative is the result of the emergency project, the cumulative effect would be the eventual failure of the temporary structures along with their removal. The Yosemite Valley Railroad had been previously compromised at the segment affected by the temporary detour. This segment would be restored to its already-compromised condition.

The build alternatives would restore the already-compromised railroad grade as does the No-build Alternative. There would be no cumulative effect on the other identified cultural resources.

Avoidance, Minimization, and/or Mitigation Measures

The bedrock mortar site is within the project area, but is situated away from the location of construction activities and would be protected during construction by designating the site as an environmentally sensitive area. Before construction, a professionally qualified staff archaeologist would oversee the placement of environmentally sensitive area fencing around the site. A Native American monitor may also be present during the establishment of the fencing. During construction, the archaeologist and a Caltrans construction liaison would regularly inspect the fencing to determine that it is intact and that the protected site is undisturbed.

If cultural materials were discovered during construction, all earth-moving activity within and around the immediate discovery area would be diverted until a qualified archaeologist could assess the nature and significance of the find.

If human remains were discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities would stop in any area or nearby area suspected to overlie remains, and the county coroner contacted. Per Public Resources Code Section 5097.98, if the remains were thought to be Native American, the coroner would notify the Native American Heritage Commission, which would then notify the Most Likely Descendent. At this time, the person who discovered the remains would contact the District 10 Heritage Resources Coordinator who would work with the Most Likely Descendent on the respectful treatment and disposition of the remains. Further provisions of Public Resources Code Section 5097.98 are to be followed as applicable.

3.2 Physical Environment

3.2.1 Hydrology and Floodplain

Regulatory Setting

Executive Order 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. Requirements for compliance are outlined in 23 Code of Federal Regulations 650 Subpart A.

To comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments
- Risks of the action
- Impacts on natural and beneficial floodplain values
- Support of incompatible floodplain development
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values affected by the project

The base floodplain is defined as “the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year.” An encroachment is defined as “an action within the limits of the base floodplain.”

Affected Environment

A Location Hydraulic Study and a Floodplain Evaluation Report Summary were completed in September 2007 using Flood Insurance Rate Maps for the unincorporated areas of Mariposa County. An Addendum to the Location Hydraulic Study was then completed July 2008 and addressed the additional alternatives.

The Location Hydraulic Study analyzed the potential impacts of the proposed project on the floodplain. According to the Flood Insurance Rate Maps, the damaged section of State Route 140 is within the 100-year base floodplain designated as “Zone A.” Zone A is defined as special flood areas inundated by the 100-year flood with no base flood elevations determined. It has been determined that the existing highway within the project area would be inundated by the base flood and the highway with or without the proposed structures would be unusable during such a flood.

The floodplain in the project area possesses natural and beneficial uses, which include recreational opportunities, a very high water quality, groundwater discharge, and fish, wildlife and plant habitats.

Environmental Consequences

The upstream and downstream bridges that are being proposed by Alternatives C, T, S, and S-2 would be placed within the base floodplain, but they would not parallel the river, which avoids encroaching on the floodplain longitudinally. A longitudinal encroachment is defined as any structure encroaching on the base floodplain and constructed parallel to the river. The structures for Alternatives C, T, and S would increase the water surface elevation 4.54 feet. The structures for Alternative S-2 would increase the water surface elevation 4.45 feet. This rise in water elevation is substantial, but only occurs between the upstream and downstream bridges and not throughout the entire floodplain. The upper portions of these bridges would be above the base floodplain, but the approaches connecting the bridges to the existing roadway would be below the base floodplain.

Alternatives C, T, and S further affect the recreational value of the floodplain by placing permanent bridge piers within the river channel. The water quality of the floodplain would be affected by both short- and long-term impacts such as excavation activities during construction and bridge maintenance activities. Alternative S-2 poses similar water quality impacts as Alternatives C, T, and S, but would not impact long-term recreational uses. There would be minor impacts to the riparian habitat as structures would be placed within or adjacent to the river channel.

Alternative T-3 would not adversely affect the base floodplain, but rather provide an alternate passage for some of the base floodwaters. During a base flood event, the tunnel could pass water up to 8 feet deep. This alternative places a structure within the base floodplain, but is not considered a longitudinal encroachment since it does not parallel the river. While Alternative T-3 would avoid any impacts to the recreational activities, some long-term water quality impacts would occur from tunnel maintenance activities. Both plant and wildlife habitat would also be removed as a result of this alternative.

Alternative R is considered a longitudinal encroachment because it would place a tunnel structure below the predicted high water mark for a 100-year flood event and parallel to the Merced River. This encroachment would produce a maximum backwater increase of 2.38 feet within the base floodplain. Alternative R, much like

Alternative T-3, would avoid any impacts to the recreational activities with some long-term water quality impacts occurring from tunnel maintenance activities. Both plant and wildlife habitat would also be removed as a result of this alternative.

The No-build Alternative would be temporarily affected by a 20-year event because of its at-grade alignment with the existing highway. Should these temporary bridges be damaged by floodwaters, they could be found unsafe to carry traffic and the highway would be cut off to through traffic. Upon these bridges' removal from general wear, all the structures associated with the temporary detour would be removed from the base floodplain. There would no longer be an impact to the floodplain or its beneficial values. Refer to Table 2.1 for details on all of the alternatives impacts to the floodplain values.

Cumulative Impacts

Since the No-build Alternative is the result of the emergency project, the cumulative effect would be the eventual failure of the temporary structures, whether from general wear or a 20-year flood event. The long-term effect would be no impact to the base floodplain.

Cumulatively, Alternatives C, T, S, and S-2 would replace the temporary bridges with permanent bridges that would be able to pass floodwaters during a 20-year event. When a 100-year event occurs, the highway would be inundated with water and unusable even though the structures from these alternatives would be above the flood line. Alternatives T-3 and R would replace the temporary bridges with tunnels. For Alternative R, the tunnel is considered a longitudinal encroachment that backs up floodwaters throughout the floodplain to just above 2 feet. Alternative T-3 is not a longitudinal encroachment and would pass floodwaters because the tunnel alignment goes into the mountain rather than parallel the river and act as an obstruction.

Avoidance, Minimization, and/or Mitigation Measures

No mitigation measures would be required for Alternatives C, T, S, S-2, and T-3. There would be no feasible mitigation measures for Alternative R. Constructing the rockshed would result in a longitudinal encroachment, and Executive Order 11988 directs that longitudinal encroachments on the floodplain should be avoided unless it is the only practicable alternative.

3.2.2 Water Quality and Storm Water Runoff

Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, the Federal Water Pollution Control Act was amended, making the discharge of pollutants to the waters of the United States from any point source unlawful, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The Federal Water Pollution Control Act was subsequently amended in 1977 and was renamed the Clean Water Act (CWA). The CWA, as amended in 1987, directed that storm water discharges are point source discharges. The 1987 CWA amendment established a framework for regulating municipal and industrial storm water discharges under the NPDES program. Important CWA sections are as follows:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for any federal project that proposes an activity, which may result in a discharge to waters of the United States to obtain certification from the State that the discharge will comply with other provisions of the act.
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) into waters of the United States. Regional Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) establishes addresses storm water and non-storm water discharges.
- Section 404 permit program for the discharge of dredge or fill material into waters of the United States. This permit program is administered by the U.S. Army Corps of Engineers (ACOE).

The objective of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

State Requirements: Porter-Cologne Water Quality Control Act (California Water Code)

California’s Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a “Report of Waste Discharge” for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives) required by the CWA, and regulating discharges to ensure that the objectives are met. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. States designate beneficial uses for all water body segments, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use.

In addition, each state identifies waters failing to meet standards for specific pollutants, which are state listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source controls, the CWA requires establishing Total Maximum Daily Loads (TMDLs). TMDLs establish allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, water pollution control, and water quality functions throughout the state. RWQCBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

NPDES Program

The SWRCB adopted Caltrans Statewide NPDES Permit (Order No. 99-06-DWQ) on July 15, 1999. This permit covers all Department rights-of-way, properties, facilities, and activities in the State. NPDES permits establish a 5-year permitting time frame. NPDES permit requirements remain active until a new permit has been adopted.

In compliance with the permit, the Department developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of Best Management Practices (BMPs). The proposed project will be programmed to follow the guidelines and procedures outlined in the

2003 SWMP to address storm water runoff or any subsequent SWMP version drafted and approved.

Municipal Separate Storm Sewer System Program

The U.S. EPA defines a Municipal Separate Storm Sewer System (MS4) as any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that are designed or used for collecting or conveying storm water. As part of the NPDES program, U.S. EPA initiated a program requiring that entities having MS4s apply to their local RWQCBs for storm water discharge permits. The program proceeded through two phases. Under Phase I, the program initiated permit requirements for designated municipalities with populations of 100,000 or greater. Phase II expanded the program to municipalities with populations less than 100,000.

Construction Activity Permitting

Section H.2, Construction Program Management of the Department's NPDES permit states: "The Construction Management Program shall be in compliance with requirement of the NPDES General Permit for Construction Activities (Construction General Permit)" Construction General Permit (Order No. 2009-009-DWQ, adopted on September 2, 2009, became effective on July 1, 2010. The permit will regulate storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of 1 acre or greater, and/or are part of a common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least 1 acre must comply with the provisions of the General Construction Permit.

The newly adopted permit separates projects into Risk Levels 1–3. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring. Risk levels are determined during the design phase and are based on potential erosion and transport to receiving waters. Applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPP).

Caltrans Statewide NPDES Permit requires the Department to submit a Notice of Construction (NOC) to the RWQCB to obtain coverage under the Construction

General Permit. Upon project completion, a Notice of Completion of Construction (NOCC) is required to suspend coverage. This process will continue to apply to Department projects until a new Caltrans Statewide NPDES Permit is adopted by the SWRCB. An NOC or equivalent form will be submitted to the RWQCB at least 30 days prior to construction if the associated DSA is 1 acre or more. In accordance with the Department's Standard Specifications, a Water Pollution Control Plan (WPCP) is used for projects with DSA less than 1acre.

During the construction phase, compliance with the permit and the Department's Standard Special Conditions requires appropriate selection and deployment of both structural and non-structural BMPs. These BMPs must achieve performance standards of Best Available Technology economically achievable/Best Conventional Pollutant Control Technology (BAT/BCT) to reduce or eliminate storm water pollution.

Affected Environment

A Water Quality Report was completed for the project on August 15, 2007. An updated Water Quality Assessment Report, which includes analysis of the additional alternatives, was completed on November 14, 2008. An Amended Water Quality Assessment Report was completed on September 14, 2010.

The project site lies within the North Fork Merced Hydraulic Area 537.30 of the Merced River Hydrologic Unit. The watershed is 160,784 acres, with an annual rainfall of 41.9 inches. Major streams in this area are the Merced and South Fork rivers. The Merced River is designated as a Wild and Scenic River, and the segment of the Merced River that flows through the project area is classified as recreational, the least restrictive of the three classifications attributed to segments of Wild and Scenic Rivers because of the presence of the highway and Incline Road, which provides access to the recreational activities on the river. The water quality of the Merced River within the project vicinity is good to excellent.

The proposed project is located within the jurisdiction of the Central Valley Regional Water Quality Control Board (Region 5). The Central Valley Regional Water Quality Control Board has adopted a Water Quality Control Plan (Basin Plan) for the area encompassing the project site. Listed within the Basin Plan are designated beneficial uses of the Merced River from its source down to Lake McClure. They are irrigation, industrial power, recreation, fresh water habitat, and wildlife habitat. Water quality objectives consist of narrative and numerical goals and are established to preserve the

beneficial uses of regional water bodies and must comply with the Federal Anti-degradation Policy. This policy requires that the Regional Water Quality Control Board maintain the beneficial uses that existed in 1975 or the best possible water quality since that time.

The Upper Merced River is not presently designated as high quality water (Tier 2) and is not subject to the State Anti-Degradation Policy (SWRCB Resolution 68-16). Should municipal or domestic use become a future beneficial use, the Upper Merced River could be designated a Tier 2 water and be entitled to a more protective status under Resolution 68-16.

The project area is also located within the Yosemite Valley Groundwater Basin #5-69 in Mariposa County. The Basin lies beneath the floor of Yosemite Valley at an approximate elevation of 4,000 feet. Recharge to groundwater occurs through direct precipitation and from the Merced River. Groundwater is of very good quality and is suitable for all uses. The groundwater resources in the project area possess four beneficial uses, which include municipal or domestic supply, agricultural supply, industrial service supply, and industrial process supply.

Environmental Consequences

Short-term impacts to surface water quality could occur during the construction of the build alternatives. The potential surface water quality impacts are as follows:

- Increases in sediments, turbidity (cloudiness), and total dissolved solids from the construction of the bridge piers within the river channel
- Toxicity due to chemical substances originating from construction activities

Impacts may occur from exposing loose soil during excavation, as well as grading and filling activities. Suspended solids, dissolved solids, and organic pollutants in surface water runoff could increase when nearby soils are disturbed and dust is generated. Changes in storm water drainage could potentially affect the water quality as well. Sediments suspended in runoff could be carried downstream and may accumulate, potentially harming any downstream aquatic resources and water quality. Accidents or improper use of construction materials such as oil and petroleum products may result in the release of chemical contaminants into surface water resources. Groundwater could be temporarily and minimally impacted as it becomes recharged.

The No-build Alternative would have short-term impacts on water quality from storm water runoff from the bridge structure and bridge maintenance activities.

Potential long-term water quality impacts associated with bridge replacement projects occur from pollutants entering a water body via storm water runoff. Increased pollutant discharges from the road surface during storm events, including oil, trash, dust, brake linings, hazardous-materials spills during traffic accidents, and illegal dumping could occur. Alternatives C, T, S, and S-2 may have long-term impacts that could occur from storm water runoff from the bridge structure and bridge maintenance activities. Alternatives R and T-3 would have similar long-term impacts, but the runoff would be a result of tunnel maintenance activities instead.

Impacts can also occur from increases in storm water runoff. Storm water runoff rates can be increased from the addition of impervious roadway surface areas, modifications of design features in the channel, and alterations to stream morphology and hydraulics. Wherever concentrated flow from the highway surface cannot be adequately controlled, erosion may occur. Erosion from concentrated flow can cause gullies, alter stream geomorphology, and discharge sediment to waterways.

Alternatives C, T, and S would place two bridges within the bed and banks of the Merced River. The design of the upstream bridge would slightly change the speed and force of the river's flow from its natural conditions by 1 to 1.5 feet per second. The downstream bridge would not affect the movement of the sediments. For Alternatives S2-V1 and S2-V2, the bridge piers would be constructed above the Q2 or active bankfull (ordinary high water mark) river channel. Alternatives R and T-3 would not have any direct construction in the riverbed.

The No-build Alternative would only produce temporary minor changes in the flow velocity of the river, with slightly higher flow rates in the center of the channel just below the downstream bridge and at the center pier of the upstream bridge. Since the change in flow velocity is minimal, the potential for the river to move sediment is generally unchanged from the river in its natural condition.

Additional impervious roadway surfaces were calculated for the proposed project. These surface areas were then used to estimate storm water runoff flows for each alternative.

Table 3.3 compares the storm water runoff of each alternative to the storm water runoff for the entire watershed.

Table 3.3 Comparison of Storm Water Runoff Flows

Proposed Alternatives	Baseline Impervious Area (Acres)	Proposed Impervious Area (Acres)	Baseline Runoff (Cubic Feet/Second)	Proposed Runoff (Cubic Feet/Second)	Runoff for Watershed (Cubic Feet/Second)
Alternative C	1.10	2.23	0.68	1.38	337,640
Alternative T	1.10	2.23	0.68	1.38	337,640
Alternative S	1.10	2.83	0.68	1.74	337,640
Alternative S2-V1	1.10	1.90	0.68	1.17	337,640
Alternative S2-V2	1.10	1.90	0.68	1.17	337,640
Alternative T-3	1.10	2.42	0.68	1.49	337,640
Alternative R	1.10	1.10	0.68	0.68	337,640
No-build (Temporary)	1.10	1.10	0.68	0.68	337,640

Storm water flows were calculated using the Rational Method ($Q=CiA$). Q =peak discharge from a given area, C =coefficient relating the runoff to rainfall, i =average rainfall intensity, and A =drainage area.

The areas listed in Table 3.3 would be the total proposed impervious acreage for these alternatives since Incline Road would be restored to a natural condition as the pavement would be removed. The abandoned section of State Route 140 adjacent to the rockslide would also be removed and restored to a natural condition with the exception of Alternative R. Alternative R would construct on the existing alignment, which is 1.10 acres. As with the other alternatives, the Incline Road pavement would be removed leaving just the 1.10 acres impervious.

The No-build Alternative would temporarily have an impervious area of 1.10 acres. The temporary nature of the No-build Alternative bridge structures (they have an estimated useful life of 5 to 10 years) and the fact that they could be overrun with flood waters in the event of a heavy precipitation year leave the area vulnerable to loss of highway access from a sudden failure of the structures. The agreement with the U.S. Forest Service does not allow the reconstruction of the temporary detour bridges. When they fail, which will be within a decade due either to flooding or general wear, State Route 140 will be permanently severed in the absence of a permanent solution. With the No-build Alternative, the impervious area would be reduced to 0 acre within the project area once the temporary bridge structures fail or become damaged by floodwaters.

As shown in Table 3.3, Alternatives C and T propose storm water runoff flows of 1.38 cubic feet/second. This flow is approximately double the flow of the baseline or No-build Alternative, which is 1.10 cubic feet/second. Alternative S proposes the largest runoff flow at 1.74 cubic feet/second. Alternatives S2-V1 and S2-V2 propose runoff flows to be 1.17 cubic feet/second, which is slightly more than the baseline flow. Alternative T-3 proposes a runoff flow of 1.49 cubic feet/second, which is slightly more than double the baseline flow. Alternative R would be constructed on the existing alignment, which would produce a 1.10 cubic feet/second runoff flow, an amount equivalent to the baseline flow.

The No-build Alternative, which represents the baseline would temporarily produce the 1.10 cubic feet/second flow until the eventual failure of the bridge structures occurs from either general wear or damage from a flood event. The impervious area for the No-build Alternative would be reduced to 0.00 acre with the removal of the temporary bridges and pavement. The runoff flow would also be reduced to 0.00 cubic feet/second. The increases in runoff flow from the proposed project would be minimal when compared to the runoff flow of the entire watershed, which is 337,640 cubic feet/second.

These water quality impacts would not cause or contribute to the impairment of a designated beneficial use of an impaired water body nor violate any water quality standards or waste discharge requirements. The proposed project would not substantially alter the river hydraulics and create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems, or cause substantial additional sources of polluted runoff.

The proposed alternatives would sustain the existing water quality, maintain the outstandingly remarkable values associated with the recreational functions of the river in the project area and comply with the Federal Anti-Degradation provisions of the Clean Water Act. For recreational impacts, refer to Section 3.1.1.3 Wild and Scenic Rivers. Minimization and/or mitigation measures would be incorporated into the project to reduce all potential impacts to the maximum extent practicable. These measures are explained below.

Cumulative Impacts

Since the No-build Alternative is the result of the emergency project, the cumulative effect would be the eventual failure of the temporary structures. There would no longer be structures affecting the water quality, however the past impacts of the

emergency project have produced storm water runoff from the temporary bridges and Incline Road pavement.

Cumulatively, Alternatives C, T, S, and S-2 would replace the temporary bridges with permanent bridges that would turn short-term storm water runoff impacts into long-term impacts. Alternatives T-3 and R would replace the temporary bridges with tunnels, also potentially turning short-term storm water runoff impacts into long-term impacts.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of the project would require construction activities within the natural flow of the Merced River. Management measures in the form of a Storm water Pollution Prevention Plan, design pollution prevention best management practices, construction site temporary best management practices, and Maintenance best management practices are required to address water quality impacts during planning, design, construction, and operational and maintenance stages. Best management practices for roads, highways, and bridges include the following:

- Prior to work in or near the river, coffer dams, culverts, and/or other temporary water diversion features would be installed to reduce sedimentation during construction. Diverted or impounded water would not be discharged into the river prior to removing sediment.
- Land disturbing activities and the installation of erosion and sedimentation control practices shall be coordinated to reduce on-site erosion and off-site sedimentation. These measures may include mulches, soil binders and erosion control blankets, silt fencing, fiber rolls, sediment desilting basins, sediment traps, and check dams.
- Loose bulk materials may be applied to the soil surface as a temporary cover to protect bare soils from rainfall, increase infiltration, and reduce runoff and erosion.
- Water shall be applied to the soil surface to prevent the movement of dust at the project area due to traffic, wind, and grading activities.
- All areas shall be restored to pre-construction contours and revegetated with native species.
- Provide berms along the tops of slopes to prevent water from running uncontrolled down the slopes. Transport the water at the berms through an erosion proof drainage system. Sediment that is collected at the berms would be allowed to settle out and then be removed from the site.

- Provide energy dissipaters and erosion control pads at the bottom of slope drains. Other flow conveyance control mechanisms may include earth dikes, swales, and ditches.
- All construction related materials would be hauled off-site after completion of construction.
- All erosion control measures and storm water control measures would be properly maintained until the site has returned to a pre-construction state.
- All construction roadway areas would be properly protected to prevent excess erosion, sedimentation, and water pollution.
- All vehicle and equipment maintenance procedures would be conducted off-site.
- All concrete curing activities would be conducted to minimize spray drift and prevent curing compounds from entering the river.
- All construction materials, vehicles, stockpiles, and staging areas would be situated outside of the river channel. All stockpiles would be covered as feasible.
- Work within the bed and banks of the river would be limited to the period between April 15 and October 15 to avoid the rainy season.

Storm water runoff systems should promote sheet flow through vegetation, use open vegetated channels and conveyances, and minimize curb, dike, and pipe. The following pollution prevention measures are being proposed in the drainage plan of this project:

- Culverts would discharge surface runoff from the project to unlined channels. To minimize scour (erosion), check dams, drainage inlets, and energy dissipation systems would be incorporated into the drainage design.
- Flared end sections and energy dissipation devices would be constructed at all culvert outlets.
- All ditches would be stabilized with erosion control. The newly constructed slopes would be stabilized with erosion control.

The selection of best management practices depends on site- and project-specific circumstances and conditions. The best management practices are applied to control, reduce, or treat runoff water quality impacts to the maximum extent practicable using best conventional technology and best available technology in order to comply with the water quality objectives of the Basin Plan.

3.2.3 Geology/Soils/Seismic/Topography

Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects “outstanding examples of major geological features.” Topographic and geologic features are also protected under the California Environmental Quality Act.

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. Caltrans’ Office of Earthquake Engineering is responsible for assessing the seismic hazard for Caltrans projects. The current policy is to use the anticipated Maximum Credible Earthquake, from young faults in and near California. The Maximum Credible Earthquake is defined as the largest earthquake that can be expected to occur on a fault over a particular period of time.

Affected Environment

The Preliminary Geotechnical Design Report (August 1, 2007) and Geotechnical Design Report (October 31, 2007) documented the literature review and surface/subsurface explorations used to evaluate the nature and extent of the geologic and geotechnical conditions of the project area. A Geotechnical Design Report Addendum was completed on March 24, 2008 and incorporates the analysis of the additional alternatives.

The project lies in the Merced River Canyon, which is in the west-central portion of the Sierra Nevada Geomorphic Province. The canyon is bounded by the Sierra Nevada fault system to the east and the Great Valley to the west. The bedrock that underlies the project area and the Ferguson rockslide are part of the Calaveras Complex, which is made of very hard metamorphic rock called phyllite and chert. In some places, the bedrock is exposed at the surface. At other locations, such as the slopes, the bedrock is covered with a thin layer of soil and angular pieces of rock called colluvium. The river channel is made of alluvium, which is composed of rounded cobbles and boulders. The temporary bridges were constructed on abutments built into the bed and banks of the river channel.

The Ferguson rockslide as a geologic formation occurred in the phyllite that has been fractured and folded to a near vertical position, maybe as long as 10,000 or more years ago. When the rocks become unstable, slide material comes loose from the

Ferguson rockslide and falls down the mountain. In the spring of 2006, approximately 60 percent of the slide material cascaded down the slope and covered State Route 140. The volume of slide material still on the slope is roughly 700,000 cubic yards. The rockslide material is composed entirely of elongated, angular, metamorphic boulders up to 20 feet wide. A possible explanation for the most recent rockslide could be that it was caused by a rise in ground water due to rainfall; however it is difficult to determine exactly how rainfall totals contributed to the movement of the rockslide. Other dormant slides may exist adjacent to the Ferguson rockslide. In addition, minor rockfalls could occur from natural slopes and existing cuts.

Caltrans has concluded that there is an extremely low probability that the Ferguson rockslide would fail catastrophically and in one rapid motion dam the Merced River and bury Incline Road. This conclusion is based on evidence derived from mapping the rockslide and surrounding terrain. The mapping shows evidence from changes in slope shape and vegetative cover that at a minimum, two previous episodes of rockslide movement occurred. The mapping further indicates that the time between these episodes could be in the thousands of years.

There are cobble and boulder deposits along the north side of the river. These cobbles and boulders are less than 2 feet in diameter and are mostly composed of granite rock with a minor amount of metamorphic rock. The northern slope across the Merced River and opposite the Ferguson rockslide contains no topographic features such as scarps and closed depressions that are associated with rockslides. During soil boring testing, nothing was found that could be interpreted as rockslide debris, which eliminates any history of rockslides large enough to span the river. There is no evidence that debris from these past rockslides was deposited on the north side of the Merced River.

Caltrans also concludes that the rockslide moves at a slow to moderate rate as relatively intact blocks of rock. It is expected that future movements by the Ferguson rockslide would be smaller than the 2006 episode. This is due to the loss of potential energy each time a rockslide event occurs. A future rockslide would add to the existing rock debris pile gradually narrowing the river channel, forcing flows towards Incline Road and gradually raising river levels.

A study prepared for the U.S. Geological Survey called *Simulations of Potential Runout and Deposition of the Ferguson Rockslide, Merced River Canyon, California* stated that the Ferguson rockslide could move extremely rapidly like a sand-and-

gravel flow. That statement is contrary to the study performed by Caltrans, which found that the rockslide moves at a slow rate and as intact blocks. A report prepared by the U.S. Forest Service supports the conclusion that the rockslide would move at a slow rate.

The five nearest active fault zones are located to the southwest and northeast of the project area. They are the Forest Hill-Melones fault, the Prairie Creek-Spence fault, the Silver Lake fault, the Hartly Springs fault, and the Mono Lake fault. These faults are located between 12 and 45 miles away from the project area. There are no known active faults within the project area.

Ground water in the form of seeps was found along the highway and the detour alignment.

Environmental Consequences

Alternatives C, T, S, and S-2 would be unaffected by future rockslide movement because the highway alignment would be redirected and elevated across the river to the northern slope. Given the reasoning discussed in the Affected Environment section, a potential rockslide would not affect the opposite side of the river. The natural slopes located above the proposed Alternative T-3 and Alternative R entrances would produce rockfall.

The No-build Alternative would be temporarily exposed to potential rockslides because the detour bridges and alignment are constructed at the existing highway grade and do not elevate as they cross the river. The temporary bridges would eventually be removed, and therefore a potential rockslide could no longer affect them. Refer to Chapter 2 for details on the amount of rock material each alternative would remove from the project area.

For the build alternatives, the bedrock may be cut and excavated by using blasting equipment such as hydraulic splitters and hoe rams. The cut and fill slopes for the proposed build alternatives would not be erosive because the bedrock exposed during excavation is made of hard phyllite and chert. The cuts from Alternatives C, S, and S-2 could produce rockfalls. The material that would be used for the fill is likely to be coarse-grained. However, the colluvium or loose soil at the surface could erode. The alluvium within the river channel could potentially scour or wear from high-river flows whereas the bedrock would not scour. The No-build Alternative would have no temporary effect on the bedrock.

Caltrans designs its structures for seismicity by establishing a Maximum Credible Earthquake. The maximum credible earthquake is established by using correlations between fault lengths, displacement, and area and earthquake magnitudes. Earthquake acceleration for a particular site is also analyzed by comparing three parameters, the maximum credible earthquake, the peak historical acceleration, and the distance from the site to the fault.

The Silver Lake fault would produce the highest earthquake acceleration at the project area, and that acceleration is not considered very strong. An earthquake would not cause surface rupture and liquefaction at the project area.

Alternatives C, T, S, S-2, and the No-build would avoid disturbing topographic features adjacent to the Ferguson rockslide that may be dormant rockslides. Alternatives R and T-3 may be constructed within or adjacent to these features.

Ground water could be encountered during the excavation of the proposed cut slopes for Alternatives C, S, and S-2 and for the blasting and drilling of the tunnels in Alternatives T and T-3.

Cumulative Impacts

Since the No-build Alternative is the result of the emergency project, the cumulative effect would be the eventual failure of the temporary structures. With the initial construction of these bridges, Incline Road was graded but the northern slope was not affected. The bed and banks of the river channel were excavated for the placement of the bridge abutments. Upon removal, there would no longer be structures within the river channel and the channel would be restored to previous conditions.

Cumulatively, Alternatives C, T, S, and S-2 would replace the temporary bridges with permanent bridges that would restore Incline Road to natural conditions but result in cutting on or tunneling through the northern slope. Alternatives T-3 and R would also replace the temporary bridges with tunnels and restore Incline Road. Both of these alternatives would not disturb the northern slope but excavate into the area under the slide as well as remove the talus part of the rockslide itself. The river channel would be restored to its natural conditions.

Avoidance, Minimization, and/or Mitigation Measures

By using the blasting equipment mentioned above, the rock material being excavated would be controlled as to prevent the spread of rock material, limit ground vibrations, and limit noise.

To avoid rock fracturing, the slopes for Alternatives C, T, S, and S-2 would be cut at a 1:4 ratio or flatter. Since the cuts would produce minor rockfalls, a 22-foot-wide area would be cut adjacent to and at the same grade as the highway to prevent rocks from falling onto the highway.

The entrances for both Alternatives R and T-3 would be constructed at least 150 feet away from the flanks of the slide. Placing the entrances at this location would provide adequate distance for more rockfall debris to accumulate without spilling onto the highway and blocking the tunnels. When constructing the entrances, the slopes would be cut at a 1:4 ratio. A catchment area at-grade, rockfall barriers, or a combination of the two would also be required for these alternatives to protect the roadway from the possibility of falling rock.

Drains may be required to control unanticipated ground water flows, maintain slope stability, and prevent rockfalls.

3.2.4 Hazardous Waste or Materials

Regulatory Setting

Hazardous materials and hazardous wastes are regulated by many state and federal laws. These include not only specific statutes governing hazardous waste, but also a variety of laws regulating air and water quality, human health, and land use.

The primary federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act of 1976 and the Comprehensive Environmental Response, Compensation and Liability Act of 1980. The purpose of the Comprehensive Environmental Response, Compensation and Liability Act, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. The Resource Conservation and Recovery Act provides for “cradle to grave” regulation of hazardous wastes.

Other federal laws include the following:

- Community Environmental Response Facilitation Act of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety & Health Act
- Atomic Energy Act

- Toxic Substances Control Act
- Federal Insecticide, Fungicide, and Rodenticide Act

In addition to the acts listed above, Executive Order 12088, Federal Compliance with Pollution Control, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

Hazardous waste in California is regulated primarily under the authority of the federal Resource Conservation and Recovery Act of 1976, and the California Health and Safety Code. Other California laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

Worker health and safety and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous material disturbed during project construction is vital.

Affected Environment

Caltrans completed an Initial Site Assessment for the project on June 13, 2007. An addendum to the Initial Site Assessment studying the additional alternatives was completed on August 28, 2008. A subsequent addendum was completed in July 2009.

Field surveys and record searches were used to identify potential hazardous waste concerns within the project area. The project area consists of State Route 140 running close to the base of the Merced River Canyon slopes and alongside the Merced River. The surrounding land is owned by the U.S. Forest Service and consists of steep mountain slopes with vegetation. A former railroad alignment exists on the north side of the Merced River; a segment of that alignment was converted into the one-lane paved detour around the rockslide.

Soil samples collected adjacent to the former railroad alignment and current one-lane paved detour were analyzed for Title 22 metals. Title 22 metals include elemental, organic, and inorganic compound forms of antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc. Hazardous levels of many of these metals and their numerous compounds can be found in many common contaminant sources, including motor oil, manufacturing/processing wastes, and mine tailings. In some areas, they can be found occurring naturally in rock outcrops.

Elevated arsenic levels were the only potential concern identified within the project area. The total threshold limit concentration for arsenic is 500 micrograms per kilograms. The soluble threshold limit concentration is 5.0 micrograms per liter. The levels of arsenic noted to be in the project area are well below the total threshold and soluble limit levels. However, the arsenic levels exceed the Commercial/Industrial California Human Health Screening Level of 0.24 microgram per kilograms. The Commercial/Industrial California Human Health Screening Level serves as a guideline to aid in determining clean-up levels at contaminated sites.

Environmental Consequences

The results of the analysis identified elevated arsenic levels (24 to 56 micrograms per kilogram) in three of four surface soil samples. The sources of the elevated arsenic levels could be associated with the former railroad alignment, historical mining operations, or localized bedrock mineralized zones.

For all of the build alternatives and even the removal of the No-build Alternative, elevated arsenic levels may in the future present a health hazard to people working in the area of the detour or occupying the area for recreational purposes. All of the build alternatives propose to restore Incline Road to its natural condition by removing the existing pavement. The No-Build would continue to use Incline Road temporarily as State Route 140 leaving the pavement in place, which poses no immediate impact. Restoration of Incline Road would occur when the detour is removed either from general wear or the construction of the build alternatives.

Cumulative Impacts

Since the No-build Alternative is the result of the emergency project, the cumulative effect would be the eventual failure of the temporary structures. The removal of the bridges could expose workers and individuals recreating along Incline Road to the elevated levels of arsenic.

Cumulatively, all of the build alternatives would restore Incline Road to its natural condition by removing the existing pavement. The emergency project graded Incline Road for the placement of pavement, by which the pavement acted as a cap that covered potentially contaminated soil. The build alternatives would remove the pavement, once again exposing construction workers and others using Incline Road.

Avoidance, Minimization, and/or Mitigation Measures

The presence of elevated arsenic levels along the one-lane detour is a project constraint with respect to soil management and disposal where planned roadway improvements generate excess soil from the area. Before offsite disposal of any excess soil generated from excavations within the vicinity of the one-lane detour, soil sampling, testing, and notification of arsenic levels would be provided to the offsite disposal facility for proper disclosure and material acceptance.

Caltrans construction and maintenance personnel and contractors would be properly notified of potential risks associated with elevated arsenic levels in the soil. Dust control and proper hygiene would be practiced during construction. Any planned pedestrian and/or recreational uses of the one-way detour would incorporate risk management controls such as using dirt free of hazardous materials or paving areas with high arsenic content to minimize exposure.

3.2.5 Air Quality

Regulatory Setting

The Clean Air Act as amended in 1990 is the federal law that governs air quality. Its counterpart in California is the California Clean Air Act of 1988. These laws set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns; the criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM), lead (Pb), and sulfur dioxide (SO₂).

Under the 1990 Clean Air Act Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to State Implementation Plan for achieving the goals of the Clean Air Act requirements. Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Regional-level conformity in California is concerned with how well the region is meeting the standards set for carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), and particulate matter (PM). California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans (RTP) are developed

that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, an air quality model is run to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as the Mariposa County Local Transportation Commission for Mariposa County and the appropriate federal agencies, such as the Federal Highway Administration, make the determination that the RTP is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project level also requires “hot spot” analysis if an area is “nonattainment” or “maintenance” for carbon monoxide (CO) and/or particulate matter. A region is a “nonattainment” area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called “maintenance” areas. “Hot spot” analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated, and in “nonattainment” areas the project must not cause any increase in the number and severity of violations. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

Affected Environment

An Air and Noise Report was originally completed on August 15, 2007. An Amended Air Report was completed on August 19, 2010.

The project area is located in the Mountain Counties Air Basin in Mariposa County. The climate is semi-arid, characterized by hot, dry summers and mild winters. At higher altitudes, distinct wet and dry seasons prevail.

Environmental Consequences

According to 40 CFR Section 93.126 Table 2, this project falls under the category of repair of damage caused by natural disasters, civil unrest, or terrorist acts, except

projects involving substantial functional, location, or capacity changes. Such projects may proceed toward implementation even in the absence of a conforming transportation plan and Transportation Improvement Program. This project would restore the damaged section of State Route 140 back to a two-lane highway. Through interagency consultation, the Federal Highway Administration and the U.S. Environmental Protection Agency concurred with the exemption on July 20, 2010.

During construction, the proposed project would generate air pollutants. The exhaust from construction equipment contains hydrocarbons, oxides of nitrogen, carbon monoxide, suspended particulate matter, and odors. The largest percentage of pollutants would be windblown dust generated during excavation, grading, hauling, and various other activities. The impacts of these activities would vary each day as construction progresses.

Avoidance, Minimization, and/or Mitigation Measures

Caltrans Standard Specifications pertaining to dust control and dust palliative requirements is a required part of all construction contracts and should effectively reduce and control emission impacts during construction. The provisions of Caltrans Standard Specifications, Section 14-1.01 “Air Pollution Control” and Section 14-1.02 “Dust Control” require the contractor to comply with the Mariposa County’s Air Pollution Control District’s rules, ordinances, and regulations.

3.2.6 Noise

Regulatory Setting

The National Environmental Policy Act of 1969 and the California Environmental Quality Act provide the broad basis for analyzing and abating the effects of highway traffic noise. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between the National Environmental Policy Act and the California Environmental Quality Act.

California Environmental Quality Act

The California Environmental Quality Act requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under the California Environmental Quality Act, then the act dictates that mitigation measures must be incorporated into the project unless such measures are not feasible. The rest of this

section will focus on the National Environmental Policy Act-23 Code of Federal Regulations 772 noise analysis; please see Chapter 4 for further information on noise analysis under the California Environmental Quality Act.

National Environmental Policy Act and 23 Code of Federal Regulations 772

For highway transportation projects with Federal Highway Administration (and Caltrans, as assigned) involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 Code of Federal Regulations 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations contain noise abatement criteria that are used to determine when a noise impact would occur. The noise abatement criteria differ depending on the type of land use under analysis. For example, the criterion for residences (67 decibels) is lower than the criterion for commercial areas (72 decibels). The following table lists the noise abatement criteria for use in the National Environmental Policy Act and 23 Code of Federal Regulations 772 analysis, and Table 3.5 shows the noise levels of typical activities.

Table 3.4 Activity Categories and Noise Abatement Criteria

Activity Category	Noise Abatement Criteria, A-weighted Noise Level, Average Decibels Over One Hour	Description of Activities
A	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 Exterior	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals
C	72 Exterior	Developed lands, properties, or activities not included in Categories A or B above
D	--	Undeveloped lands
E	52 Interior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Source: Caltrans Traffic Noise Analysis Manual, 1998

A-weighted decibels are adjusted to approximate the way humans perceive sound

Table 3.5 Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Jet Fly-over at 300m (1000 ft)	110	Rock Band
Gas Lawn Mower at 1 m (3 ft)	100	
Diesel Truck at 15 m (50 ft), at 80 km (50 mph)	90	Food Blender at 1 m (3 ft)
Noisy Urban Area, Daytime	80	Garbage Disposal at 1 m (3 ft)
Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft)
Commercial Area		Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	60	Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		Library
Quiet Rural Nighttime	30	Bedroom at Night, Concert Hall (Background)
	20	Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

In accordance with Caltrans *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects*, August 2006, a noise impact occurs when the future noise level with the project is a substantial increase from existing levels (substantial is defined as a 12-decibel or more increase) or when the future noise level with the project approaches or exceeds the noise abatement criteria. Approaching the noise abatement criteria is defined as coming within one decibel of the noise abatement criteria.

If it is determined that the project would have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

Caltrans' *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A noise abatement measure (for example, a sound wall) must be shown to produce at least a 5-decibel reduction in the future noise level to be considered feasible. Other considerations include topography, access requirements, other noise sources, and safety. The reasonableness determination, on the other hand, is essentially a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents' acceptance, the absolute noise level, build versus existing noise, environmental impacts of abatement, public and local agencies' input, newly constructed development versus development pre-dating 1978, and the cost per benefited residence.

Affected Environment

The Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment stated that the proposed project would not require a noise analysis. However, upon further review, it was determined that a noise analysis would be needed to address the proposed realignment of State Route 140 and the effects of the highway traffic noise on recreational users within the project area. A Noise Study Report was completed on September 4, 2008.

Within the project area, the Merced River is used primarily for whitewater rafting but is also used for fishing and swimming. Incline Road was being used as a bicycle, pedestrian, and equestrian trail until the construction of the one-lane detour, which currently realigns State Route 140 across the river, along Incline Road, and back across the river to the existing alignment. There are no residences or businesses in the project area. Alternatives C, T, S, and S-2 propose to bridge the Merced River and Incline Road, which brings the noise from vehicle traffic closer to and above rafters and trail users.

Environmental Consequences Under the National Environmental Policy Act

Two field noise measurements were used to document the existing background noise levels generated by the river and to calibrate the noise model for future noise level calculations. Two locations were then modeled to represent recreational users near the proposed downstream and upstream bridges. Table 3.6 summarizes the results of the noise impact analysis for the project.

Table 3.6 Existing and Post-Project Noise Levels

Receiver Location	Existing Noise Level (decibels)	Predicted Future Noise Level with Background Noise for Alternatives C, T, S, and S-2 (decibels)
Upstream Bridge	61.6	61.6
Downstream Bridge	55.0	55.0
Upstream Recreational User	61.6	61.6
Downstream Recreational User	61.6	62.6

The existing background noise levels in the area are primarily generated by the river flowing swiftly over rocks in its course. The noise levels at the downstream and upstream bridges are 55.0 and 61.6 decibels. Recreational users located within the vicinity of the upstream bridge would not experience an increase in noise levels due to vehicle traffic. Recreational users located within the vicinity of the downstream bridge would experience a noise level increase of 1 decibel. This increase in noise level can be attributed to the difference in bridge profiles. The downstream bridge would be constructed at a level closer to the river, while the upstream bridge would be constructed at a higher level, farther away from the river. Since the downstream bridge would be lower, vehicle traffic would be brought closer to the recreational user. The 1-decibel increase in the noise level is not considered detectable by the healthy human ear and would not affect recreational activities.

The No-build Alternative, which leaves the temporary bridges in place, does not have an immediate or short-term impact on recreational users. However, with the eventual removal of these bridges, construction methods such as excavating the bridge abutments and piers, dismantling the bridge structure, and removing pavement would temporarily impact noise levels within the project area. Once the temporary detour

has been taken down, State Route 140 would be cut off to through traffic and the noise levels within the project area would no longer be affected.

For the build alternatives, the increase or decrease in noise levels during construction would vary in intensity and be temporary and intermittent depending on the type of construction activity. Alternatives C, T, S, and S-2, would construct bridges and temporarily generate increased noise levels by boring into bedrock and pile driving bridge piers. Alternatives T and T-3 would construct tunnels and temporarily generate increased noise levels by a combination of blasting and drilling through bedrock. Noise levels would also temporarily increase from the cutting and excavating of both the northern and southern canyon slopes with the construction of Alternatives C, S, S-2, and R.

Cumulative Impacts

Since the No-build Alternative is the result of the emergency project, the cumulative effect would be the eventual failure of the temporary structures. The removal of the bridges would cause a short-term increase in the noise level and, with the completion of their removal, the project area would no longer experience increased noise.

Cumulatively, the proposed bridge alternatives, which are C, T, S, and S-2, would create a permanent 1-decibel increase for individuals recreating at the downstream bridge. Alternatives R and T-3 would not bring noise levels closer to individuals recreating along the river. The cumulative effect of Alternatives R and T-3 would remain temporary as noise levels would return to their existing level once construction is complete.

Avoidance, Minimization, and/or Noise Abatement under the National Environmental Policy Act

The following measures would be implemented to minimize construction noise on the recreational users.

- Whenever possible, use construction methods or equipment that would provide the lowest level of noise (for example, alternative low noise pile installation methods).
- Use newer or well-maintained equipment with improved muffling, and ensure that all equipment items have the manufacturer's recommended noise abatement measures, such as mufflers, engine enclosures, and engine vibration isolators intact and operational.

- Turn off idling equipment.
- Use temporary noise barriers and relocate them as needed to protect recreational users against excessive construction noise. These barriers can be made of heavy plywood or movable insulated sound blankets.
- Implement a construction noise-monitoring program to limit the impacts.
- Conduct noisier operations when there are few recreational users in the area.
- Keep noise levels relatively uniform and avoid impulsive noises.
- Maintain good public relations with the community to minimize objections to unavoidable construction noise.

3.3 Biological Environment

3.3.1 Natural Communities

Regulatory Setting

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed in Threatened and Endangered Species, Section 3.3.5. Wetlands and other waters are discussed in Section 3.3.2.

Affected Environment

Oak woodland communities make up a major portion of California's ecosystems, occupying about 10 million acres of land. Many animal species are dependent on oak woodlands, which are also the favored habitat of many plant species. Within the project area, 76 of the 218 plant species observed are native species found under oaks. Included in this number are three rare plant species: Tompkins' sedge (*Carex tompkinsii*), Mariposa clarkia (*Clarkia biloba* ssp. *australis*), and smallflower monkeyflower (*Mimulus inconspicuus*). Refer to Sections 3.3.3 and 3.3.5 for impacts to these rare plant species.

These species provide a good example of the specific benefits oaks provide. Tompkins' sedge and smallflower monkeyflower were found growing in the shade of oaks, often directly beneath them, benefiting from the moderating influence over

temperature and light provided by the shade. These species may also be benefiting from the nutrients particular to oak woodland soils. The *Clarkia* species, in contrast, were usually found in open areas between oaks, but always where they were shaded by an oak or by a rock face. They may be benefiting either directly from the shade produced by the oaks or indirectly by the lower grass density found in the partly shaded open areas between the oaks.

Oak woodland communities comprise the entire project area outside of the Merced River channel and its adjacent riparian corridor. Please see Section 3.3.2 for impacts to the riparian corridor.

Environmental Consequences

Table 3.7 shows the impacts that the proposed alternatives would have on oak woodlands along with the cumulative impacts from the emergency project and the proposed project.

Table 3.7 Oak Woodland Impacts and Cumulative Impacts

	Alt C	Alt T	Alt S	Alt S-2	Alt R	Alt T-3	No-Build	Past Impacts
Project Impacts (Acreage)	3.3	0.4	0.9	1.7	2.10	0.45	0	8 oaks
Cumulative Impacts	3.3 acres would be removed in addition to the previously removed 8 oaks	0.4 acre would be removed in addition to the previously removed 8 oaks	0.9 acre would be removed in addition to the previously removed 8 oaks	1.7 acres would be removed in addition to the previously removed 8 oaks	2.10 acres would be removed in addition to the previously removed 8 oaks	0.45 acre would be removed in addition to the previously removed 8 oaks	0	NA

The No-build Alternative would not impact oak woodland from either temporarily leaving the detour in place or from its eventual removal from the environment.

Cumulative Impacts

The construction of the emergency project removed 5 oak trees from the riparian zone and 3 oak trees from the upland zone. Since the No-build Alternative is the result of the emergency project, the cumulative effect would be the removal of the temporary detour and the total removal of 8 oak trees.

For the build alternatives, impacts to oak woodland are calculated in acres since the area of impact is more easily determined than an individual number of trees. Thus, the cumulative result would be the proposed acreage to be removed along with the previously removed 8 oak trees. Refer to Table 3.6 for details on cumulative impacts.

Avoidance, Minimization, and/or Mitigation Measures

Caltrans biologists and landscape specialists would continue to coordinate with the U.S. Forest Service regarding the planting of appropriate vegetation during and after construction. These plantings would include native oak species as well as other native shrubs and plants. Current coordination efforts have included discussions with the U.S. Forest Service about collecting and planting seeds from the project area to compensate for the removal of oaks.

For Alternatives C, T, S, and S-2, the pavement and roadbed of any unused portions of the existing State Route 140 immediately to the east and west of the Ferguson rockslide would be removed, re-graded, and replanted according to a revegetation plan approved by the U.S. Forest Service and California Department of Fish and Game. Caltrans would continue to coordinate with the American Indian Council of Mariposa regarding the planting of appropriate vegetation during and after construction.

Caltrans would specifically compensate for oaks at a 3:1 ratio based on the acreage of impact. For Alternatives C, T, S, and S-2, offsite compensation might be necessary to fulfill the 3:1 ratio. This would be made possible by restoring a currently disturbed site or purchasing and preserving an intact oak woodland. All compensation plans onsite or offsite would be approved by the California Department of Fish and Game and the U.S. Forest Service.

3.3.2 Wetlands and Other Waters

Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Clean Water Act (33 U.S. Code 1344) is the primary law regulating wetlands and waters. The Clean Water Act regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the Clean Water Act, a three-parameter approach is used that

includes the presence of water-loving vegetation, wetland hydrology, and soils subject to saturation/inundation. All three must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the Clean Water Act.

Section 404 of the Clean Water Act establishes a regulatory program that provides that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers with oversight by the Environmental Protection Agency.

The Executive Order for the Protection of Wetlands (11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this executive order states that a federal agency, such as the Federal Highway Administration, and Caltrans as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the California Department of Fish and Game and the Regional Water Quality Control Boards. Sections 1600-1607 of the Fish and Game Code require any agency that proposes a project that would substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify the California Department of Fish and Game before beginning construction. If the California Department of Fish and Game determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. California Department of Fish and Game jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the Army Corps of Engineers may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the Department of Fish and Game.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The Regional Water Quality Control Boards also issue water quality certifications in compliance with Section 401 of the Clean Water Act. A Section 401 Water Quality Certification is

required before the U.S. Army Corps of Engineers will issue a Section 404 permit for dredge and fill. Please see the Water Quality section for additional details.

Affected Environment

The Merced River fits under the definition of a jurisdictional Waters of the United States and has been designated as a Wild and Scenic river (for recreational classification) protected by the National Wild and Scenic Rivers Act. For more information on the impacts to the Merced River, see Section 3.1.1.3.

There are no wetlands in the project area.

The riparian corridor that lines the Merced River channel is characterized by sparse vegetation due to the frequent flooding. The riparian area is dominated by California ash (*Fraxinus latifolia*), red willow (*Salix laevigata*), and less frequently, Fremont's cottonwood (*Populus fremontii ssp. fremontii*) and dusky willow (*Salix melanopsis*). The shrub cover is dominated by arroyo willow (*Salix lasiolepis*) and buttonbush (*Cephalanthera occidentalis*). The torrent sedge (*Carex nudata*) is the dominant herb along the water margin. California wild grape (*Vitis californica*) forms large colonies on the river bank below the roadway, and redbud (*Cercis occidentalis*) is prominent on the roadsides between riparian area and the foothill woodland.

Environmental Consequences

Table 3.8 shows the amount of fill material in the form of bridge columns that would be permanently placed below the ordinary high water mark of the Merced River channel along with the cumulative impacts from the emergency project and the proposed project.

Table 3.8 Waters of the U.S. Impacts and Cumulative Impacts

	Alt C	Alt T	Alt S	Alt S-2	Alt R	Alt T-3	No-Build	Past Impacts
Project Impacts (Acreage)	0.06	0.06	0.05	None	None	None	None	A total of 0.005
Cumulative Impacts (Acreage)	0.06 in addition to the previously filled 0.005	0.06 in addition to the previously filled 0.005	0.05 in addition to the previously filled 0.005	A total of 0.005	NA			

Table 3.9 shows the impacts that the proposed alternatives would have on the riparian area along with the cumulative impacts from the emergency project and the proposed project.

Table 3.9 Riparian Area Impacts and Cumulative Impacts

	Alt C	Alt T	Alt S	Alt S-2	Alt R	Alt T-3	No-Build	Past Impacts
Project Impacts (Acreage)	0.5	0.5	0.8	1.5	None	None	None	10 trees
Cumulative Impacts	0.5 acre in addition to the previously removed 10 trees	0.5 acre in addition to the previously removed 10 trees	0.8 acre in addition to the previously removed 10 trees	1.5 acres in addition to the previously removed 10 trees	10 trees	10 trees	10 trees	NA

The No-build Alternative would not impact Waters of the U.S. or its associated riparian area from either temporarily leaving the detour in place or from its eventual removal from the environment.

For Alternatives C, T, S, and S-2, Caltrans would obtain the following permits:

- Section 404 of the Clean Water Act, which would be issued by the Army Corps of Engineers for the discharge of fill material into the Merced River
- Section 401 of the Clean Water Act, which is a State Certification from the Regional Water Quality Control Board and would be issued for discharges into the Merced River

- Section 1602 of the California Fish and Game Code, which is a streambed Alteration Agreement from the California Department of Fish and Game would be issued for work in the bed and on the bank of the Merced River

Cumulative Impacts

The construction of the emergency project placed 0.005 acre of fill (bridge piers) into the Merced River and removed 10 trees from the riparian area. The 10 trees consist of the same 5 oak trees removed from the riparian area as documented in the oak woodland section, and 5 other species of trees. Since the No-build Alternative is the result of the emergency project, the cumulative effect would be the removal of the temporary detour, which includes removing the bridge piers and there would no longer be fill within the river, which leaves a cumulative impact of 0.005 acre of fill. A total of 10 trees were removed by the emergency project, however the No-build Alternative would not further remove any riparian trees. The cumulative effect would be the 10 trees that were removed.

Cumulatively, Alternatives C and T would place a total of 0.065 acre of fill into Waters of the U.S. Alternative S would place a total of 0.055 acre of fill into the river and Alternatives S-2, R, and T-3 would only place 0.005 acre of fill, which would be entirely from the emergency project as these alternatives would not place any fill in the river. For the build alternatives, impacts to the riparian area are calculated in acres since the area of impact is more easily determined than an individual number of trees. Thus, the cumulative result would be the proposed acreage to be removed along with the previously removed 10 trees. Refer to Tables 3.7 and 3.8 for details on cumulative impacts.

Avoidance, Minimization, and/or Mitigation Measures

Compensation for impacts to the Waters of the United States may include monetary compensation at a 1.5:1 ratio through the U.S. Army Corps of Engineers' National Fish and Wildlife Foundation.

3.3.3 Plant Species

Regulatory Setting

The U.S. Fish and Wildlife Service and California Department of Fish and Game share regulatory responsibility for the protection of special-status plant species. "Special-status" species are selected for protection because they are rare and/or subject to population and habitat declines. Special-status is a general term for species

that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act and/or the California Endangered Species Act. Please see Threatened and Endangered Species, Section 3.3.5, in this document for detailed information regarding these species.

This section of the document discusses all the other special-status plant species, including California Department of Fish and Game fully protected species and species of special concern, U.S. Fish and Wildlife Service candidate species, and non-listed California Native Plant Society rare and endangered plants.

The regulatory requirements for the Federal Endangered Species Act can be found at U.S. Code 16, Section 1531, et seq. See also 50 Code of Federal Regulations Part 402. The regulatory requirements for the California Endangered Species Act can be found at California Fish and Game Code, Section 2050, et seq. Caltrans projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act, Public Resources Code, Sections 2100-21177.

Affected Environment

A Natural Environment Study was completed for the project on November 12, 2007. A revised Natural Environment Study, which includes an analysis of the additional alternatives, was completed in January 2009.

Tompkins' Sedge

Tompkins' sedge (*Carex tompkinsii*) is a Sierra Nevada species known mainly from the Kings River drainage in Fresno County and the Merced and Tuolumne river drainages in Mariposa and Tuolumne counties. Its preferred habitat is dry, rocky soil found in canyon sides and canyon bottoms between 1,900 and 2,950 feet in elevation. Within the project area, Tompkins' sedge occurs on the south side of the river on north- and east-facing slopes. This plant species is Forest Service Sensitive and California Native Plant Society Rare 4.

Mariposa Clarkia

Mariposa clarkia (*Clarkia biloba* ssp. *australis*) is a Sierra Nevada species that ranges from Mariposa to Tuolumne counties and resides within the Merced River Canyon along the south fork of the Merced River and in the main stem of the river down to

Briceburg. It is also present along Bear Creek from Briceburg to Midpines. It appears to favor sites where there is shade from interior live oak and few shrubs. Large populations of Mariposa clarkia begin above the cut banks of the highway and continue uphill to the edge of the Ferguson rockslide and on intact portions of the rockslide. This plant species is Forest Service Sensitive and California Native Plant Society Rare 1B.

Copper Moss

Copper moss (*Mielichhoferia elongate*) is geographically widespread with a range that includes North America, Europe, and Asia. It is found within the Merced River Canyon between Briceburg and El Portal, usually tucked into a corner of a narrow ledge. Its critical habitat factors are low soil-water pH and high concentrations of sulphite ions. Within the project area, four small patches of the moss were observed. Three were found on human-made rock overhangs along the highway and temporary detour; the fourth was on a natural rock overhang on the west-facing slope of the canyon. This plant species is Forest Service Sensitive and California Native Plant Society Rare 2.

Smallflower Monkeyflower

The smallflower monkeyflower (*Mimulus inconspicuus*) is found in scattered populations of a few individuals in shaded banks of small streams, meadow edges or the north-facing slopes of the canyon. It has threadlike stems, few leaves, and a few pale pink flowers. Its current known distribution is entirely within California. It is known to occur in the Sierra Nevada foothills from El Dorado County to the Transverse Ranges in Los Angeles County and Glenn and Butte counties.

Within the project area, the smallflower monkeyflower population was found beginning about 80 feet above the highway in the deep shade of oaks on the northeast-facing slope and on the eastern side of the rockslide. There are several small patches of about 10 to 200 individuals scattered on the hillside. This plant species is California Native Plant Society Rare 4.

Environmental Consequences

Tompkins' Sedge

Alternatives C, T, S, S-2, and the No-build Alternative would not affect any Tompkins' sedge plants during construction or during the removal of the temporary bridges.

Alternatives R and T-3 would cut into the slopes on the south side of the river where Tompkins’ sedge habitat has been identified. Alternative R would affect 2.10 acres of habitat, and Alternative T-3 would affect 0.45 acre of habitat.

Mariposa Clarkia

Alternatives C, T, S, and S-2 would completely avoid the known populations of Mariposa clarkia. The No-build Alternative would not affect this plant during the removal of the temporary bridges.

Alternatives R and T-3 would cut into the slopes on the south side of the river where populations of Mariposa clarkia have been identified. Alternative R would affect 2.10 acres of habitat, and Alternative T-3 would affect 0.45 acre of habitat.

Copper Moss

Alternatives C, T, S, and T-3 would remove one to two populations of copper moss that are along the highway and the temporary detour. Alternatives R and S-2 would completely avoid the moss, and the No-build Alternative would not affect the plant during the removal of the temporary bridges. The patches of copper moss found within the project area are small and few and represent an insignificant portion of the population of this species in the canyon. The patches of moss that would be removed are on ledges of human-made rock faces that were created when the highway and rail beds were originally built. Any further cuts into these rock faces that create vertical walls and/or underhangs would only reestablish new habitat for the moss rather than diminish any habitat.

Smallflower Monkeyflower

Alternatives C, T, S, and S-2 would completely avoid the known populations of smallflower monkeyflower. The No-build Alternative would not affect this plant during the removal of the temporary bridges.

Alternatives R and T-3 could potentially affect 1.05 acres and 0.25 acre respectively of smallflower monkeyflower habitat.

Table 3.10 shows the impacts that the proposed alternatives would have on the plant species listed above.

Table 3.10 Plant Species Impacts

Project Impacts	Alternative C	Alternative T	Alternative S	Alternative S-2	Alternative R	Alternative T-3	No-Build
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Tomkins' Sedge (Acreage)	None	None	None	None	2.10	0.45	None
Mariposa Clarkia (Acreage)	None	None	None	None	2.10	0.45	None
Copper Moss (Patches)	2	2	1	None	None	1 to 2	None
Small-flower Monkey-flower (Acreage)	None	None	None	None	1.05	0.25	None

Cumulative Impacts

During the construction of the emergency project, Caltrans in conjunction with the U.S. Forest Service determined that two Tompkin's sedge plants would be impacted. In a good faith effort to minimize the impacts, the plants were transplanted to an appropriate location away from construction, but did not survive the move. The cumulative effect of the emergency project and the No-build Alternative would be the loss of the two Tompkin's sedge plants since no other plant species would be affected by the removal of the temporary bridges.

Because the emergency project did not affect Mariposa clarkia or smallflower monkeyflower, there would be no cumulative effect on these plant species from Alternatives C, T, S, and S-2. These same alternatives would not affect Tompkin's sedge either, which results in a cumulative loss of two of these plant species from the emergency project. For copper moss, one to two patches would be cumulatively affected from Alternatives C, T, S, and T-3. Alternatives S-2 and R would have no cumulative effect on this plant species.

Alternative R would affect 2.10 and 1.05 acres of Mariposa clarkia and smallflower monkeyflower habitat, cumulatively. Alternative T-3 would affect 0.45 and 0.25 acre of Mariposa clarkia and smallflower monkeyflower habitat, cumulatively. For Tompkin's sedge, the cumulative effect from Alternative R would be the removal of 2.10 acres of habitat in addition to the two plants that did not survive transplantation. Alternative T-3 would remove 0.45 acre of habitat in addition to the two plants that did not survive transplantation.

Avoidance, Minimization, and/or Mitigation Measures

Tomkins' Sedge

For Alternatives R and T-3, environmentally sensitive area fencing would be placed around the Tompkin's sedge populations to minimize their removal and protect them and their associated habitat to the maximum extent possible. Some individual plants to be affected could be transplanted with the assistance and concurrence of the U.S. Forest Service botanist.

Mariposa Clarkia

For Alternatives R and T-3, environmentally sensitive area fencing would be placed around the Mariposa clarkia populations to minimize their removal and protect them and their associated habitat to the maximum extent possible. Caltrans biologists and landscape specialists would continue to coordinate with the U.S. Forest Service and the National Park Service regarding the planting of appropriate vegetation during and after construction. This may include seed collection from affected Mariposa clarkia plants.

Copper Moss

No mitigation measures would be required.

Smallflower Monkeyflower

For Alternatives R and T-3, environmentally sensitive area fencing would be placed around the smallflower monkeyflower to minimize ground disturbance and protect them and their associated habitat to the maximum extent possible. Caltrans biologists and landscape specialists would continue to coordinate with the U.S. Forest Service and the National Park Service regarding the planting of appropriate vegetation during and after construction. This may include seed collection from affected smallflower monkeyflower plants.

3.3.4 Animal Species

Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration Fisheries Service, and the California Department of Fish and Game are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under the state or federal Endangered Species Act. Species listed or proposed for listing as threatened or endangered as well

as California Department of Fish and Game fully protected species are discussed in Section 3.3.5 below. All other special-status animal species are discussed here, including species of special concern and U.S. Fish and Wildlife Service or National Oceanic and Atmospheric Administration Fisheries Service candidate species.

Federal laws and regulations pertaining to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act
- Sections 1600–1603 of the Fish and Game Code
- Sections 4150 and 4152 of the Fish and Game Code

In addition to state and federal laws regulating impacts to wildlife, there are often local regulations (example: county or city) that need to be considered when developing projects. If work is being done on federal land (Bureau of Land Management or Forest Service land, for example), then those agencies' regulations, policies, and Habitat Conservation Plans are followed. U.S. Forest Service guidelines on the enhancement and maintenance of wildlife values pertaining to the Wild and Scenic Rivers Act includes the South Fork and Merced Wild and Scenic River Implementation Plan. Refer to Sections 3.1.1.2 and 3.1.1.3 for more information.

Affected Environment

A Natural Environment Study was completed for the project on November 12, 2007. A revised Natural Environment Study, which includes an analysis of the additional alternatives, was completed in January 2009.

Hardhead

Hardhead (*Mylopharodon conocephalus*) fish are primarily found in low-to mid-elevation streams in the main Sacramento and San Joaquin drainage, spawning mainly in April and May. Hardhead are much less abundant in Central California than they once were, but are still widely distributed in foothill streams. Although surveys for this fish were not conducted, hardhead could be present in the Merced River within the project area. This species is rated by the U.S. Forest Service as Sensitive and listed as a State Species of Special Concern.

Pallid Bat

Pallid bats (*Antrozous pallidus*) frequent rocky outcrops in lower elevations up into the forested oak and pine regions. Daytime roosts consist of rock crevices and buildings where they can retreat out of sight and wedge themselves into tight places. They are intolerant of disturbance and may abandon a roost when disturbed and not return for years. Pallid bats were observed and their calls were identified during surveys within the project area. Additionally, a night roost was observed on the South Fork Merced River Bridge only a few miles east of the project area. This species is rated by the U.S. Forest Service as Sensitive and listed as a State Species of Special Concern.

Western Red Bat

Western red bats (*Lasiurus blossevillii*) roost alone in the foliage of large shrubs and trees, frequently in streamside habitats dominated by cottonwoods, oaks, sycamores, and walnuts, but will also roost in fruit orchards within suburban areas. Western red bats or their calls were not positively identified. However, some calls were heard that were similar and could not be ruled out as being this species. This species is rated by the U.S. Forest Service as Sensitive and listed as a State Species of Special Concern.

Migratory Birds

The project area contains trees, shrubs, and rock faces that provide nesting habitat for birds protected by the Migratory Bird Treaty Act.

Environmental Consequences

Hardhead

The build alternatives and the No-build Alternative would construct and remove or just remove bridges within the active river channel. Construction activities such as the creation of small de-watered areas used for the placement or removal of bridge columns may temporarily and indirectly affect hardhead fish as the soil is stirred up and creates cloudiness within the river. This indirect impact may affect downstream habitat as the cloudy water is carried by the current.

Pallid Bat and Western Red Bat

The project would remove rocks, structures, and forested areas that provide roosting and foraging habitat for pallid and western red bats. Table 3.11 shows the potential impacts to roosting and foraging habitat along with the cumulative impacts.

Table 3.11 Impacts to Bat Roosting and Foraging Habitat and Cumulative Impacts

	Alt C	Alt T	Alt S	Alt S-2	Alt R	Alt T-3	No-Build	Past Impacts
Project Impacts	3.3 acres	0.4 acre	0.9 acre	1.7 acres	2.10 acres	0.45 acre	Removal of temporary structures	13 trees
Cumulative Impacts	3.3 acres in addition to the previously removed 13 trees	0.4 acre in addition to the previously removed 13 trees	0.9 acre in addition to the previously removed 13 trees	1.7 acres in addition to the previously removed 13 trees	2.10 acres in addition to the previously removed 13 trees	0.45 acre in addition to the previously removed 13 trees	Removal of the temporary structures in addition to the previously removed 13 trees	NA

Migratory Birds

The build alternatives would remove trees and shrubs that provide nesting habitat for birds. The No-build Alternative, which currently leaves the temporary bridges in place and would eventually require the removal of these bridges, would not affect migratory birds.

Cumulative Impacts

Since the No-build Alternative is the result of the emergency project, the cumulative effect would be the eventual removal of the temporary bridges, and that removal would temporarily cloudy the river and indirectly affect the hardhead fish. The construction of the emergency project removed 13 potential habitat trees, which includes the 8 oak trees and 5 other species from the riparian area. The No-build Alternative, which would result in the eventual removal of the temporary bridges, would eliminate the structures as being potential roosting habitat. The cumulative effect would result in the removal of the structures in addition to the previously removed 13 trees, which was caused by the emergency project.

The cumulative effect from the construction of the emergency project, the removal of the temporary bridges, and the construction of the build alternatives would be a temporary and indirect effect on the hardhead fish as the river becomes turbid from construction activities. For the build alternatives, impacts to potential bat roosting habitat are calculated in acres since the area of impact is more easily determined than an individual number of trees. Thus, the cumulative result would be the proposed

acreage to be removed along with the previously removed 13 trees. Refer to Table 3.11 for details on cumulative impacts.

Avoidance, Minimization, and/or Mitigation Measures

Hardhead

For the proposed alternatives, a “no in-stream work” window would be established in April and May to avoid impacts during the spawning season.

Pallid Bat and Western Red Bat

Alternatives C, T, S, and S-2 would install four bat boxes approved by the California Department of Fish and Game and the U.S. Forest Service in each of the two bridges. Since bridges would not be constructed for Alternatives R and T-3, mitigation for the removal of bat habitat would be accomplished by replacing oak woodland at a 3:1 ratio based on the acreage of impact.

Migratory Birds

A standard specification for the protection of migratory birds would be included in the construction contract that would allow the removal of trees only during the non-nesting season. The nesting season is defined as February 15 through September 1.

3.3.5 Threatened and Endangered Species

Regulatory Setting

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act: 16 U.S. Code, Section 1531, et seq. See also 50 Code of Federal Regulations Part 402. This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration, and Caltrans as assigned, are required to consult with the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration Fisheries Service to ensure that they are not undertaking, funding, permitting or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 is a Biological Opinion or an incidental take statement. Section 3 of the Federal Endangered Species Act defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

California has enacted a similar law at the state level, the California Endangered Species Act, California Fish and Game Code, Section 2050, et seq. The California Endangered Species Act emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats.

The California Department of Fish and Game is the agency responsible for implementing the California Endangered Species Act. Section 2081 of the Fish and Game Code prohibits “take” of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.”

The California Endangered Species Act allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by the California Department of Fish and Game. For projects requiring a Biological Opinion under Section 7 of the Federal Endangered Species Act, the California Department of Fish and Game may also authorize impacts to the California Endangered Species Act species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

In addition to the California Endangered Species Act, the State of California places certain species on a “Fully Protected” list. A fully protected status prevents the Department of Fish and Game from authorizing a take of any species designated as fully protected through the usual Fish and Game Code Section 2081 permit process.

Affected Environment

A Natural Environment Study was completed for the project on November 12, 2007. A revised Natural Environment Study, which includes an analysis of the additional alternatives, was completed in January 2009.

Merced Clarkia

Merced clarkia (*Clarkia lingulata*) is extremely endemic or associated with a particular area. This plant species is known to be located in only two confirmed locations. One is at an upstream location, less than a mile from the project area where the south fork and the main stem of the Merced River meet. The downstream location is also less than a mile away on the slope at the north tip of the Ferguson Ridge. This species is listed as endangered by the California Department of Fish and Game.

The Merced clarkia was not observed during surveys conducted in 2007. During surveys conducted in the past, two unconfirmed sightings of Merced clarkia were reported within the project area.

Limestone Salamander

Limestone salamanders (*Hydromantes brunus*) are excellent climbers that live in crevices of cliffs and ledges and in limestone under the canopy of foothill oak woodland, especially where the rocks are overgrown with moss. They are active during the fall, winter, and spring rains, especially during cold spells. This species has been found only along the Merced River drainage in Mariposa County.

The limestone salamander was designated as a threatened species by the State of California in 1971. It is also designated as fully protected through Section 5050 of the California Fish and Game Code, which means a take of this species cannot be authorized through the Section 2081 permitting process and implementation of mitigation measures. Since an incidental take of this species is not permitted by the California Department of Fish and Game, there are no mitigation measures available for the removal of this species habitat, which could result in a take of the salamanders. The U.S. Forest Service considers the limestone salamander to be a part of the “outstandingly remarkable value” for wildlife, one of the values by which the Merced River was designated as wild and scenic. Refer to Section 3.1.1.3 for more information.

Limestone salamanders were seen during surveys at various locations on the south side of the Merced River within the project area. All areas on the north side of the river within the project area were characterized as unsuitable or potentially poor habitat. See Appendix H for limestone salamander habitat.

Ringtail

The ringtail is a nocturnal species and in the same family as the raccoon. Ringtails live in brushy and wooded areas at the lower and middle elevations. They are commonly found in foothill canyons and along waterways with a preference for chaparral, rocky hillsides, and riparian habitat.

In 1968, the ringtail was designated as Fully Protected through Section 4700 of the Department of Fish and Game Code. In 1980, the Department of Fish and Game recommended removing the ringtail from the list because the data showed that ringtails were either stable or increasing in numbers. However, the ringtail is still

designated as Fully Protected and, as with the limestone salamander, a take of this species cannot be authorized through the Section 2081 permitting process and implementation of mitigation measures.

During bat surveys, one adult ringtail was observed a quarter mile west of the project area. The Merced River Canyon is considered prime habitat for the ringtail, and it is likely that there are greater numbers of the species present in the area of the project than just the one observed.

Environmental Consequences

Caltrans met with the California Department of Fish and Game to request its concurrence that impacts to the limestone salamander would be completely avoided with implemented avoidance measures. The California Department of Fish and Game also discussed the issuance of a 2081 permit for any impacts to Merced clarkia from the build alternatives. See Chapter 5 Comments and Coordination for additional information on coordination.

Merced Clarkia

Alternatives C, T, S, and S-2 would completely avoid potential habitat for Merced clarkia. The No-build Alternative, which leaves the temporary bridges in place, would not affect this plant while the bridges are in place or upon their eventual removal.

Alternatives R and T-3 would cut into the slope on the south side of the river where the unconfirmed observations of Merced clarkia were made. Although no confirmed sightings were made, the project area is considered potential habitat. Alternatives R and T-3 would affect 2.10 acres and 0.45 acre of habitat, respectively.

Limestone Salamander

Alternatives C, T, S, and S-2 would completely avoid impacts to this species. Alternatives C, T, S, and S-2 would require tapering the approaches to the bridges to match the existing highway alignment. This tapering would avoid cutting into the southern slopes where the salamanders were observed. If cuts were determined to be necessary, construction activities would only be allowed in areas considered as poor to fair habitat. The No-build Alternative would not affect the limestone salamander while the temporary bridges are in place or upon their eventual removal.

Alternatives R and T-3 would remove 2.10 acres and 0.45 acre of limestone salamander habitat and likely result in a take of the salamanders as defined in the California Endangered Species Act. If the habitat is not destroyed but the disturbance

would kill the salamanders, then this would result in a take as well. Take could result from changes in above and below ground hydrology and blasting and excavating activities. A permit to construct these two alternatives cannot be issued by the Department of Fish and Game because of the Fully Protected status of the limestone salamander.

Ringtail

The proposed alternatives would involve ground disturbance on both the northern and southern slopes of the canyon, which is potential ringtail habitat. However, construction-related activities would encourage any ringtails to move away to another area and thereby avoid a take of these animals under the California Endangered Species Act.

Cumulative Impacts

There would be no cumulative effects to the Merced clarkia, limestone salamander, and ringtail as a result of the emergency project and the No-build Alternative, which leaves the temporary bridges in place until their eventual failure and removal from the environment. Additionally, there would be no cumulative effects to these resources as a result of the emergency project and Alternatives C, T, S, and S-2.

Since the emergency project did not affect the Merced clarkia, limestone salamander or ringtail, impacts to these resources would only occur as a result of constructing Alternatives R and T-3. Alternatives R and T-3 would remove 2.10 acres and 0.45 acre of Merced clarkia and limestone salamander habitat as noted above in the environmental consequences section.

Avoidance, Minimization, and/or Mitigation Measures

Merced Clarkia

For Alternatives R and T-3, environmentally sensitive area fencing would be placed around the Merced clarkia habitat to protect it to the maximum extent possible. Merced clarkia is a state endangered species that requires consultation with the California Department of Fish and Game and a 2081 permit to authorize any impacts from the construction of Alternatives R and T-3.

Limestone Salamander

Under Section 5050 of the California Fish and Game Code, the fully protected status prevents the Department of Fish and Game from authorizing a take of the limestone salamander through the usual Fish and Game Code Section 2081 permit process.

Caltrans has and will continue to have informal discussions with the Department of Fish and Game to present any measures that would avoid a take of this species.

A construction work window may be established to prevent construction-related activities from occurring on the southern slope during the salamander's active season, which is defined as December through March. Environmentally sensitive area fencing in the form of 5-foot orange plastic mesh as well as salamander protection fencing in the form of 24-inch sheet metal would be erected if construction-related activities were to occur adjacent to limestone salamander habitat and during their active season.

Ringtail

If ground disturbance occurs during the ringtail reproductive season, defined as March through August, then qualified biologists would conduct field identification surveys for potentially active dens. If an active den is located, construction activities within 150 feet would temporarily be stopped and the Department of Fish and Game would be consulted about the protection of the den.

3.3.6 Invasive Species

Regulatory Setting

On February 3, 1999, President Bill Clinton signed Executive Order 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” Federal Highway Administration guidance issued August 10, 1999 directs the use of the state's noxious weed list to define the invasive plants that must be considered as part of the National Environmental Policy Act analysis for a proposed project.

Affected Environment

A Natural Environment Study was completed for the project on November 12, 2007. A revised Natural Environment Study, which includes an analysis of the additional alternatives, was completed in January 2009.

Within the project area, 40 plant species are not native. Most of these non-native species occur exclusively or primarily as roadside weeds. Several are pervasive weeds of open grassy areas, and five are listed by the Sierra National Forest as special-status noxious weeds. The weeds are cheat grass (*Bromus tectorum*), tocalote (*Centaurea*

melitensis), Himalayan blackberry (*Rubus discolor*), milk thistle (*Silybum marianum*), and woolly mullein (*Verbascum thapsus*).

Environmental Consequences

Construction-related activities from the build alternatives and the eventual removal of the temporary bridges would potentially promote the distribution of invasive plant species through ground disturbance. Cumulatively, the construction of the emergency project could have also potentially promoted the distribution of invasive plant species through ground disturbance.

Avoidance, Minimization, and/or Mitigation Measures

In compliance with the Executive Order on Invasive Species, Executive Order 13112, and subsequent guidance from the Federal Highway Administration, the landscaping and erosion control included in the project would not use species listed as noxious weeds. In areas of particular sensitivity, extra precautions would be taken if invasive species were found in or adjacent to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

3.4 Relationship Between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

The build alternatives would be consistent with the Mariposa County General Plan, the Yosemite Valley Plan, the Economic Vitality Strategy and Implementation Plan for Mariposa County, and the Sierra National Forest Land and Resource Management Plan by restoring full access to all vehicle types traveling on State Route 140. The No-build Alternative would not be consistent with state, regional, and local plans because the roadway would eventually be closed at the project area and access to communities and recreational activities along State Route 140 would be reduced by the failure of the temporary bridges.

The build alternatives would also have both beneficial and negative long-term effects. Restoring full access to all vehicle types would provide for long-term tourism to the area, cohesion between the communities within Mariposa County, and a variety of recreational uses including entering Yosemite National Park. Incline Road would be restored to its natural condition and could be used for recreational activities.

Long-term negative effects could include permanently impeding the flow of the Merced River and interfering with whitewater rafting. Alternatives C, T, and S would place piers within the rafting corridor potentially interfering with boater safety. River debris such as logs could become trapped against the piers as well. The scenic quality of the area could be decreased as structures are added to the area and with the removal of oak woodland. The build alternatives would permanently remove between 0.15 and 3.3 acres of oak woodland. Up to 3.3 acres of roosting and foraging habitat for bats could be removed. Alternatives R and T-3 would remove up to 2.10 acres of both special-status and threatened and endangered plant habitat. Alternatives R and T-3 would also permanently remove up to 2.10 acres of habitat for the ringtail and the limestone salamander. Between 0.05 and 0.06 acres of permanent fill material in the form of bridge columns would be placed below the ordinary high water mark of the Merced River channel.

Short-term, construction activities in the surrounding environment during completion of any of the build alternatives would involve noise from heavy equipment, changes to the visual environment, and potential delays in traffic. The Merced River could be affected in the short term by water quality problems, specifically turbidity and pH.

While the proposed project may have some negative effects on the natural habitats within the project area and certain alternatives may impede whitewater rafting, the long-term productivity of Mariposa County would be restored and enhanced by an adequate transportation system that supports recreational mobility, tourism, and the movement of goods and services.

3.5 Irreversible and Irrecoverable Commitments of Resources that Would be Involved in the Proposed Project

Implementation of the proposed project involves a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the proposed roadway is considered an irreversible commitment during the time period that the land is used for a highway. However, if a greater need arises for use of the land or if the highway is no longer needed, the land can be converted to another use, as will be the case for unused portions of existing State Route 140 under several of the build alternatives.

Fossil fuels, labor, and highway construction materials such as cement and aggregate would be expended in the construction of the structures and roadway. Additionally,

labor and natural resources would be used to fabricate and prepare construction materials. These materials are generally not retrievable. However, they are not in short supply and their use would not have an adverse effect on continued availability of these resources. Any construction would also require an expenditure of federal funds, which are not retrievable. The proposed project cost of \$33 million to \$179 million (2009 dollars) would be committed.

Water would be required to produce construction materials, irrigate landscaping, and maintain structures such as cleaning bridges and tunnel walls.

The commitment of these resources is based on the concept that Mariposa County residents and tourists would benefit from the fully restored State Route 140. These benefits would consist of full and unrestricted access to all recreational possibilities within Mariposa County and for residents traveling between communities, which would be anticipated to outweigh the commitment of these resources.

3.6 Construction Impacts

The proposed build alternatives range from constructing State Route 140 on a new alignment and bypassing the rockslide by bridging the Merced River to tunneling around or through the rockslide using the existing highway. Impacts from the construction of the build alternatives would be temporary and would require minimal closures of the highway as traffic would be maintained throughout construction on the temporary detour. Construction activities such as excavation and falsework construction may occur within the river channel. Following construction, the channel would be restored to its preconstruction condition with the exception of the added permanent structures. Methods for constructing the proposed build alternatives are described below.

Bridge Construction

Alternatives C, T, S, and S-2 propose the construction of two bridges to span the Merced River. One of the bridges would be constructed upstream of the rockslide and the other downstream of the rockslide. General methods for constructing these bridges are listed below:

- Excavating rock material down to the bedrock for the placement of the bridge column footing or base.
- Drilling holes in the bedrock in order to secure the column footing in place.

- Excavating rock material out from where the bridge abutments would be located.

Construction Access

Construction access specific to this project includes:

- Constructing the downstream bridge of the alternatives would require a temporary construction access that would extend into the river channel. A gravel roadbed would be placed in the channel along with a trestle, which would allow construction equipment access to the excavating and drilling location. A platform would be built to support equipment such as a crane and concrete truck.
- Constructing the gravel bed would place clean gravel 300 feet into the river channel. A trestle constructed of steel pipes and wood floor members would extend an additional 200 feet, which represents the platform. The trestle would be supported on 20 pipes secured in 3-foot diameter holes drilled within rocky substrate.
- Constructing the upstream bridge would require the use of a crane pad. The pad would be placed on the edge of Incline Road and adjacent to the river. A small hill would be removed to construct the pad.
- Staging areas for construction equipment and materials would be placed on the existing State Route 140 adjacent to the rockslide. This portion of State Route 140 is currently not being used as part of the temporary detour.

Construction Excavation

Construction excavation specific to this project includes:

- Excavating and cutting into the side of the northern hill for placement of the Alternatives S and S-2 viaduct sections. A retaining wall would be constructed at the base of the cut and adjacent to the roadway. Backfill material would be used to fill the gap in between the cut rock and the retaining wall. As this slope is cut, railing would be used to control any falling rocks.
- Excavating and cutting into the side of the northern hill would also require widening Incline Road for 250 feet to allow for the placement of construction equipment. Fill material would be placed on the side of the riverbed and act as a platform for the equipment.

- Excavating for bridge columns would require digging 10 to 30 feet deep by 15 feet wide depending upon the type of terrain where each column would be placed. Portions of these excavations would be 5 feet from the riverbank where water could enter the excavation site. Any water that invades the excavation site would be pumped into holding tanks and deposited elsewhere.
- Excavating under the existing State Route 140 would be required to construct the upstream and downstream bridge abutments and retaining walls, which would support the bridges entrances and exits. Additional chiseling or jack hammering could be used to remove hard rock and boulders.
- Excavating for the bridge abutments could be done from State Route 140, which is currently not being used as the temporary detour and would remove roadway fill 6 feet deep and as wide as the highway itself.
- Drilling holes within the excavated areas would be required to secure the column footings. A drill-mounted excavator would be used for this work. The holes would then be lined with rebar, and concrete would be poured into the hole to form the footing. Water from the river could enter the holes and would need to be pumped out into holding tanks prior to the concrete entering the hole. The construction equipment would work from the platforms that were built for that purpose.

Falsework Construction

Falsework construction includes:

- Constructing falsework or a temporary construction bridge, typically made of steel pipes and designed to support the entire concrete bridge as it is formed in place. The steel cross members of the falsework would be constructed within the riverbed.
- Constructing falsework on the riverbed would require drilling 15 to 35 holes approximately 3 to 6 feet in diameter and about 8 feet deep where the footings of the falsework could be secured. The holes would be filled with steel pipes that extend to an elevation above the ordinary high water mark and then filled with concrete, which acts as the falsework footing.
- Constructing falsework within the riverbed could temporarily release drilling materials into the river and increase the turbidity and pH of the water. To reduce exposing the river to the drilling, a coffer dam or work area around the drilling could be constructed to block water from the drilling activity.

- Constructing the falsework would affect the free flow of the river by adding 3-foot diameter falsework piers to the river channel. The piers could act as a barrier to river debris and increase the water surface elevation an estimated 9 to 12 inches during a 5-year flow.
- Removing the falsework once the permanent structure has been completed would require pulling each steel pipe along with the concrete from the holes. The holes would then be filled and recontoured. The equipment removing the falsework would use the gravel access or the new bridges as platforms when possible.

Tunnel/Rockshed Construction

Alternatives T and T-3 would require a combination of blasting and drilling techniques to construct the tunnels. Retaining walls would be built flanking the entrances and exits of the tunnels to keep rock debris from falling onto the highway.

Alternative R would be a reinforced concrete box structure supported on 20-foot-long concrete piles and anchored with tie-backs into the west canyon wall. In order to move the box structure into place, the rockslide talus, the foundation of the debris pile from the slide, would be removed and the structure pushed into place using a rail system. To increase worker safety, rock slope fence protection and remote-controlled equipment could be used. Retaining walls would be built to keep rock debris from falling onto the highway.

Alternatives C, T, R, and T-3 would all require the removal of rock material to construct the tunnels and cut areas for the highway. All the excess rock material would be hauled to a disposal site about 20 miles from the project site, requiring multiple trips for a number of trucks. These trips would generate excess dust and add traffic to the local roads.

No highway closures are anticipated during the construction of Alternatives R and T-3.

Use of Construction Equipment

Construction equipment would only be used in the areas created for construction access. The access areas would be lined with barriers to prevent fluid leaks from equipment entering any bodies of water. Concrete trucks that have delivered their loads would be required to wash out on the closed portions of the existing State Route 140 adjacent to the rockslide. Best Management Practices would be applied to prevent any discharge to the river.

Construction Schedule

For the proposed bridge alternatives, construction would be broken into three stages. During the first stage, the downstream bridge foundations would be built, along with either the viaduct sections for Alternatives S and S-2 or the tunnel and cut sections for Alternatives C and T. This stage could last for as long as 6 months and would include widening Incline Road to support construction equipment and placing protective railing at the base of the slope.

Closures of State Route 140 to traffic during the first stage would be infrequent, with each just long enough to accommodate equipment being moved around, generally about 10 minutes. Installing the protective railing would require a longer closure of around 4 hours.

During the second stage, the downstream bridge and the upstream bridge foundations would be constructed. At this stage, falsework would be erected to support the downstream bridge. Intermittent closures of the temporary detour would be necessary, first as the falsework and bridge are constructed and later as the falsework is removed. These closures would range in duration from 5 minutes to an hour as these tasks are performed. Excavating within the banks of the river during the first two stages would be done on a schedule that accommodates river rafting (refer to Section 3.1.1.3 for more details on mitigation measures).

During the third stage, the upstream bridge would be constructed and the project area cleaned up. This stage would require the same type of work and the same frequency and duration of closures as during the second stage.

Cast-In-Place Segmental Construction

Cast-in-place segmental construction is a type of construction that uses little or no falsework to construct bridges. A benefit with segmental construction is that the spans between the permanent supports can be constructed without falsework, eliminating the need for temporary vertical support members in the river. Cast-in-place segmental construction works by constructing the spans in approximately 10-foot segments using large metal forms that move along the bridge as it is built. New segments are connected to previously constructed segments. The spans continuously grow as the segments cantilever from each permanent support until they meet in the middle. Segmental construction is more costly than traditional falsework construction and generally requires larger permanent columns. Segmental construction can be used on the center span over the river for Alternatives C, T, and S without any falsework

between the columns straddling the river. Alternative S-2 could also be built using segmental construction. However, the V-Bent columns of S2-V2 will require that a certain amount of falsework or temporary supports be used around the columns. This limited falsework would only be placed in the river channel adjacent to the V-Bent columns.

The V-Bents of S2-V2 would be constructed using standard construction techniques or falsework. However, non-standard and more complex construction techniques could be used to construct the V-Bents without falsework being placed in the river channel. The V-Bents could be constructed parallel to the river channel using falsework supported by the riverbanks and not placed in the channel. Once completed, the V-Bents would be rotated into place, and the rest of the bridge would be installed using the segmental construction methods described above.

Temporary Detour Removal

The detour and the temporary bridges can be removed and the site restored to its original condition within weeks of the opening of the permanent restoration project. The asphalt concrete temporary roadway would be ground into a gravel size and hauled offsite. The metal beam guard rail and wood posts along the detour route would be dismantled and hauled to a Caltrans storage facility. The wire mesh gravel-filled retaining walls along the detour would be excavated and cut into pieces to be removed and recycled offsite. All signs and other detour equipment would be removed. Once the pavement is removed, Incline Road would be graded and restored to its original condition.

The upstream temporary bridge would be elevated up onto rollers and moved toward the detour roadway, incrementally taken apart and hauled offsite for storage. The upstream bridge supports located at the ends of this bridge along with the concrete column supports would be jack hammered into large rock size pieces and hauled offsite. All concrete used for the temporary bridges would be removed to at least 3 feet below the restored original ground surface. The downstream temporary bridge structure would be removed from its supports by crane and dismantled into pieces no larger than 7 feet by 10 feet. These bridge segments would then be hauled offsite. The downstream bridge supports would be jack hammered into rock-sized pieces and hauled offsite for disposal or recycling.

Chapter 4 California Environmental Quality Act Evaluation

4.1 Determining Significance under the California Environmental Quality Act

The proposed project is a joint project by the California Department of Transportation (Caltrans) and the Federal Highway Administration and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act and the National Environmental Policy Act. The Federal Highway Administration's responsibility for environmental review, consultation, and any other action required in accordance with the National Environmental Policy Act and other applicable federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S. Code 327. Caltrans is the lead agency under the California Environmental Quality Act and the National Environmental Policy Act.

One of the primary differences between the National Environmental Policy Act and the California Environmental Quality Act is the way significance is determined.

Under the National Environmental Policy Act, significance is used to determine whether an Environmental Impact Statement, or some lower level of documentation, would be required. The National Environmental Policy Act requires that an Environmental Impact Statement be prepared when the proposed federal action (project) *as a whole* has the potential to "significantly affect the quality of the human environment." The National Environmental Policy Act determination of significance is based on context and intensity; the California Environmental Quality Act is based on a similar concept—the environmental setting. Some impacts determined to be significant under the California Environmental Quality Act may not be of sufficient magnitude to be determined significant under the National Environmental Policy Act. Under the National Environmental Policy Act, once a decision is made regarding the need for an Environmental Impact Statement, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. The National Environmental Policy Act does not require that a determination of significant impacts be stated in the environmental documents.

The California Environmental Quality Act, on the other hand, does require Caltrans to identify each “significant effect on the environment” resulting from the project and ways to mitigate each significant effect. If the project lead agency determines that there is substantial evidence that any aspect of the project may have a significant effect on any environmental resource, then an Environmental Impact Report must be prepared. Each significant effect on the environment must be disclosed in the Environmental Impact Report and mitigated if feasible.

In addition, the California Environmental Quality Act Guidelines list a number of mandatory findings of significance, which also require the preparation of an Environmental Impact Report. There are no types of actions under the National Environmental Policy Act that parallel the findings of mandatory significance under the California Environmental Quality Act. This chapter discusses the effects of this project and California Environmental Quality Act significance.

4.2 Discussion of Significance of Impacts

4.2.1 Less than Significant Effects of the Proposed Project

There would be no impacts on the environment in the following areas:

Growth

Farmlands/Timberlands

Paleontology

Air Quality

Energy

For more information on these areas, refer to Chapter 3.

The project would have a less than significant effect on the environment in the following areas:

Consistency with State, Regional, and Local Plans – The No-build Alternative would not be consistent with these plans.

Cultural Resources – No alternatives alter any significant qualities of the already-compromised segments of the historic resources.

Hydrology and Floodplain – Alternatives C, T, S, S-2, and T-3 would not encroach longitudinally on the base floodplain.

Water Quality and Storm water Runoff – Alternatives C, T, S, S2-V1, and S2-V2 could produce long-term impacts from storm water runoff from the bridge structure and bridge maintenance activities. However, drainage culverts would be constructed to channel runoff away from the river.

Noise – Recreational users located within the vicinity of Alternatives C, T, S, and S-2 would not experience a noticeable increase in noise levels due to vehicle traffic.

Waters of the U.S. – Alternatives C, T, and S would place up to 0.06 acre of fill in the Merced River Channel.

Natural Communities – Each of the build alternatives propose to remove a portion of the oak woodland habitat.

Plant Species – Alternatives R and T-3 would remove up to 2.10 acres of sensitive plant species habitat, such as Tompkins sedge, Mariposa clarkia, and smallflower monkeyflower. Alternatives C, T, and S would only remove 1 to 2 populations of the copper moss.

Animal Species – The build alternatives would remove up to 3.3 acres of bat roosting and foraging habitat. The construction of Alternatives C, T, S, and S-2 would temporarily and indirectly affect the hardhead fish by increasing the turbidity of the river.

Invasive Species – All alternatives would potentially promote the distribution of invasive plant species through ground disturbance. Erosion control included in the project would not use species listed as noxious weeds. In areas of particular sensitivity, extra precautions would be taken if invasive species were found in or adjacent to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

For a full discussion of less than significant effects for the above issues, refer to Chapter 3.

4.2.2 Significant Environmental Effects of the Proposed Project

The project would have impacts with a significant effect on the environment in the following areas:

Visual/Aesthetics – Alternative S would contribute to a moderate degradation of the existing visual character or quality of the site, while Alternative R would contribute to a moderately low degradation.

Geology/Soils/Seismic/Topography – For the placement of the viaduct sections, Alternative S-2 would remove 126 cubic yards of rock material and Alternative S would remove 8,300 cubic yards of rock material. Because the tunnels would be constructed within the slopes of the Merced River Canyon, Alternative T would remove 70,000 cubic yards of rock material and Alternative T-3 would remove 292,000 cubic yards of rock material. Disturbances to rock formations would be within the slopes and not exposed to the surrounding landscape. Alternative R would remove 80,000 cubic yards of the rockslide talus.

Hazardous Waste or Materials – All alternatives would include removing the pavement on Incline Road, which would expose workers to elevated levels of arsenic. The proposed project would incorporate dust control measures and proper hygiene. Any planned pedestrian and/or recreational uses of the one-way detour would incorporate risk management controls such as using dirt free of hazardous materials or paving areas with high arsenic content to minimize exposure.

Noise – Construction of the build alternatives would temporarily increase noise levels within the project area.

4.2.3 Unavoidable Significant Environmental Effects

The project would have an unavoidable significant effect on the environment in the following areas:

Parks and Recreation – The No-build Alternative would eventually impact access to recreational activities along State Route 140 as well as to Yosemite National Park via State Route 140 when the temporary structures fail due to general wear.

Community Character and Cohesion – The No-build Alternative would eventually impact access between communities along State Route 140 when the temporary structures fail due to general wear.

Utilities/Emergency Services - The No-build Alternative would eventually diminish access for emergency service vehicles and equipment needing to access the east side of the rockslide because the temporary bridges support structures will eventually fail.

It may also diminish access to specialized medical care for those residents forced to drive 2.5 hours out of their way to get to the hospital in Mariposa.

Traffic and Transportation/Pedestrians and Bicycle Facilities – The No-build Alternative would eventually cut off access to recreational activities, residents, businesses, and Yosemite National Park via State Route 140 for all through residential, transit, tour, and school buses, as well as recreational and commercial traffic. The access would be cut off when the temporary bridges fail due to general wear.

Hydrology and Floodplain – Alternative R would encroach longitudinally on the base floodplain.

Geology/Soils/Seismic/Topography – Alternative C would remove 320,000 cubic yards of rock material by cutting the highway alignment through the northern slope and exposing a large area of rock formation.

For a full discussion of unavoidable significant effects for the above issues, refer to Chapter 3.

4.2.4 Significant Irreversible Environmental Changes

Threatened and Endangered Species – Alternatives R and T-3 propose to remove limestone salamander habitat, which would likely result in a take of the California fully protected limestone salamander.

Wild and Scenic Rivers – Alternatives C, T, and S would construct piers within the whitewater rafting flow of the river and impede the free-flowing character of the river. The proposed piers would also become an obstruction to boaters, which would impact the recreation value. Alternatives R and T-3 would affect the wildlife value by removing limestone salamander habitat.

For a full discussion of irreversible significant changes for the above issues, refer to Chapter 3.

4.2.5 Climate Change under the California Environmental Quality Act *Regulatory Setting*

While climate change has been a concern since at least 1988 as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change, the efforts devoted to greenhouse gas emissions reduction and climate change research and policy have increased

dramatically in recent years. These efforts are primarily concerned with the emissions of greenhouse gases related to human activity that include carbon dioxide (CO₂), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In 2002, with the passage of Assembly Bill 1493, California launched an innovative and proactive approach to dealing with greenhouse gas emissions and climate change at the state level. Assembly Bill 1493 requires the Air Resources Board to develop and implement regulations to reduce automobile and light truck greenhouse gas emissions; these regulations will apply to automobiles and light trucks beginning with the 2009-model year. In order to enact the standards, California needed a waiver from the U.S. Environmental Protection Agency. The waiver was denied by that agency in December 2007. See *California v. Environmental Protection Agency*, 9th Cir. July 25, 2008, No. 08-70011. However, on January 26, 2009, it was announced that the U.S. Environmental Protection Agency would reconsider its decision regarding the denial of California's waiver. On May 18, 2009, President Barack Obama announced the enactment of a 35.5-miles-per-gallon fuel economy standard for auto mobiles and light duty trucks, which will take effect in 2012. On June 30, 2009, the Environmental Protection Agency granted California the waiver. California is expected to enforce its standards for 2009 to 2011 and then look to the federal government to implement equivalent standards for 2012 to 2016. The granting of the waiver will also allow California to implement even stronger standards in the future. The state is expected to start developing new standards for the post-2016 model years later this year.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this executive order is to reduce California's greenhouse gas emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020, and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32, the Global Warming Solutions Act of 2006. Assembly Bill 32 sets the same overall greenhouse gas emissions reduction goals while further mandating that the Air Resources Board create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06, signed on October 17, 2006, further directs state agencies to begin implementing Assembly Bill 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Climate change and greenhouse gas reduction is also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing greenhouse gas emissions reductions and climate change. California, in conjunction with several environmental organizations and several other states, sued to force the U.S. Environmental Protection Agency to regulate greenhouse gas emissions as a pollutant under the Clean Air Act (*Massachusetts vs. Environmental Protection Agency et al.*, 549 U.S. 497 (2007)). The court ruled that greenhouse gases do fit within the Clean Air Act's definition of a pollutant and that the Environmental Protection Agency does have the authority to regulate greenhouse gases. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting greenhouse gas emissions.

On December 7, 2009, the Environmental Protection Agency Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases—carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆)—in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the Environmental Protection Agency's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by the Environmental Protection Agency and the Department of Transportation's National Highway Safety Administration on September 15, 2009.

Affected Environment

According to *Recommendations by the Association of Environmental Professionals on How to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), an individual project does not generate enough greenhouse gas emissions to significantly influence global climate change. Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of greenhouse gases. In assessing cumulative impacts, it must be determined if a project’s incremental effect is “cumulatively considerable.” See CEQA guidelines sections 15064(i)(1) and 15130. To make this determination, the incremental impacts of the project must be compared with the effects of the past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult if not impossible task.

As part of its supporting documentation for the Draft Scoping Plan, the Air Resources Board recently released an updated version of the greenhouse gas inventory for California (June 26, 2008). Shown below is a graph from that update that shows the total greenhouse gas emissions for California for 1990, 2002-2004 average and 2020 projected, if no action is taken.

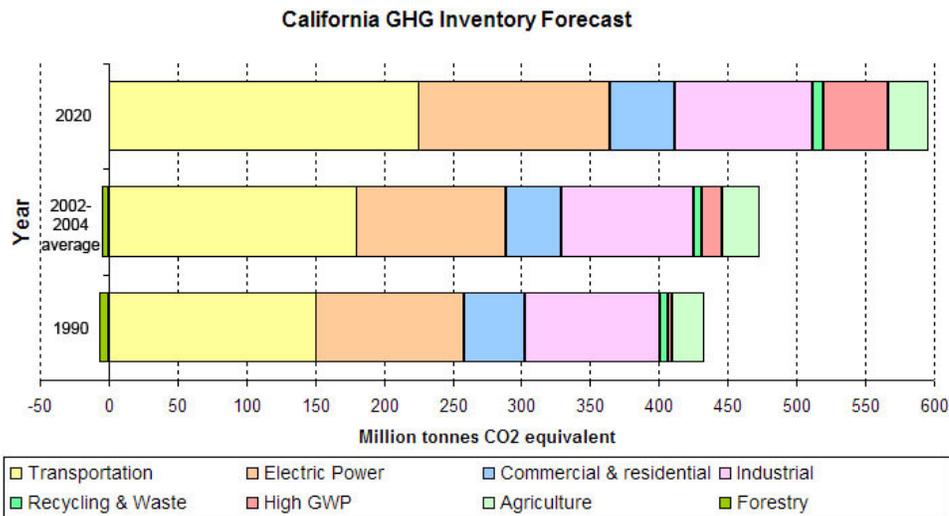


Figure 4-1 California Greenhouse Gas Inventory

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing greenhouse gas emissions reduction and

climate change. Recognizing that 98 percent of California's greenhouse gas emissions are from the burning of fossil fuels and 40 percent of all human-made greenhouse gas emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans (December 2006).

One of the main strategies in Caltrans' Climate Action Program to reduce greenhouse gas emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 miles per hour.

Environmental Consequences

Vehicles currently stopped at either end of the Ferguson rockslide detour can be delayed for up to 15 minutes, causing increased emissions in the area. Construction of the build alternatives would reduce traffic congestion and/or vehicle time delays caused by the current single-lane detour and traffic signals and contribute to reduced carbon dioxide emissions.

Caltrans recognizes the concern that carbon dioxide emissions raise for climate change. However, modeling and gauging the impacts associated with an increase in greenhouse gas emission levels, including carbon dioxide, at the project level is not currently possible. No federal, state, or regional regulatory agency has provided methodology or criteria for greenhouse gas emissions and climate change impact analysis. Therefore, Caltrans is unable to provide a scientific- or regulation-based conclusion regarding whether the project's contribution to climate change is cumulatively considerable.

Greenhouse gas emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GH greenhouse gas emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, greenhouse gas emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events. The provisions of Caltrans Standard Specifications, Section 14-1.01 "Air Pollution

Control” require the contractor to comply with the Mariposa County’s Air Pollution Control District’s rules, ordinances, and regulations.

Avoidance, Minimization, and/or Mitigation Measures

Caltrans continues to be actively involved on the Governor’s Climate Action Team as the Air Resources Board works to implement the Governor’s Executive Orders and help achieve the targets set forth in Assembly Bill 32. Many of the strategies Caltrans is using to help meet the targets in Assembly Bill 32 come from the California Strategic Growth Plan, which is updated each year.

Governor Arnold Schwarzenegger’s Strategic Growth Plan calls for a \$238.6 billion infrastructure improvement program to fortify the state’s transportation system, education, housing, and waterways, including \$100.7 billion in transportation funding through 2016. As shown in Figure 4-2, the Strategic Growth Plan targets a significant decrease in traffic congestion below today’s level and a corresponding reduction in greenhouse gas emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together yield the promised reduction in congestion. The Strategic Growth Plan relies on a complete systems approach of a variety of strategies: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.

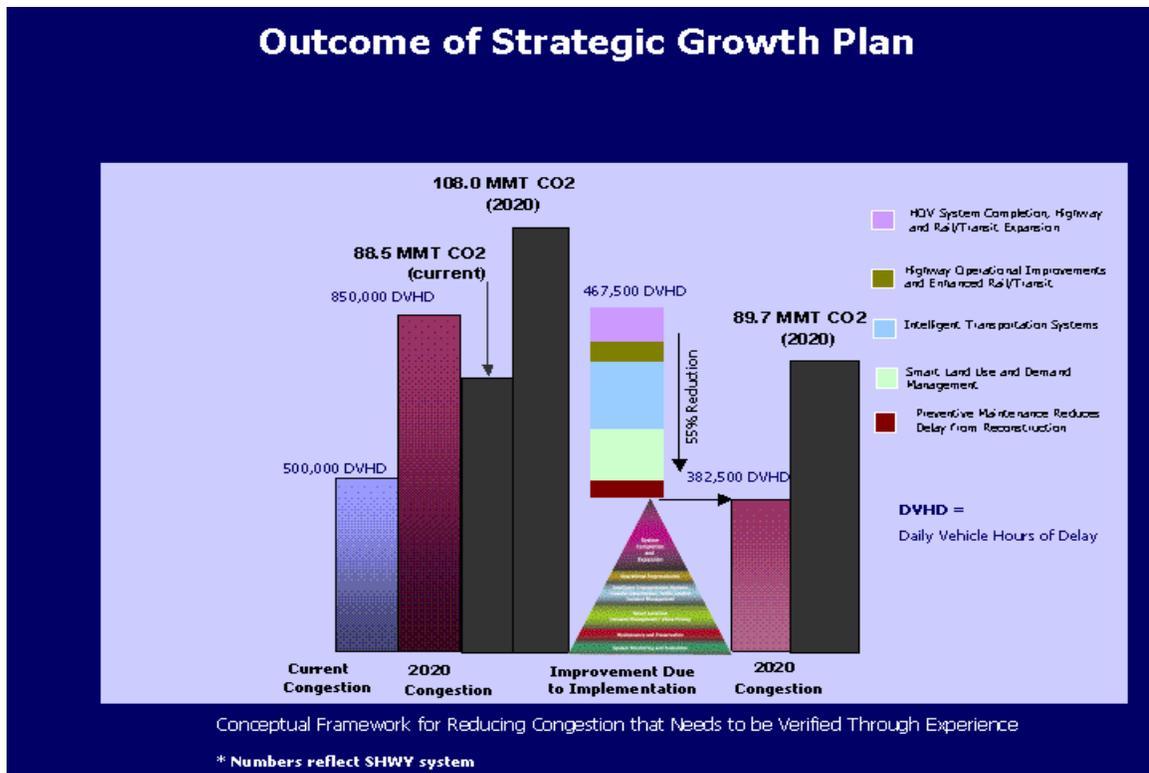


Figure 4-2 Outcome of Strategic Growth Plan

Caltrans continues to be actively involved on the Governor’s Climate Action Team as the Air Resources Board works to implement Assembly Bills 1493 and 32. As part of the Climate Action Program at Caltrans (December 2006), Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, transit-oriented communities, and high-density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars and light and heavy-duty trucks. However, it is important to note that control of fuel economy standards is held by the U.S. Environmental Protection Agency and the Air Resources Board. Lastly, the use of alternative fuels is also being considered; Caltrans is participating in funding for alternative fuel research at the University of California at Davis.

4.3 Mitigation Measures for Significant Impacts under the California Environmental Quality Act

Natural Communities – Caltrans would specifically mitigate for oaks at a 3:1 ratio based on the acreage of impact. For Alternatives C, T, S, and S-2, offsite mitigation might be necessary to fulfill the 3:1 ratio. This would be made possible by restoring a currently disturbed site or purchasing and preserving an intact oak woodland. All mitigation plans onsite or offsite would be approved by the California Department of Fish and Game and the U.S. Forest Service.

For a full discussion on Avoidance, Minimization, and/or Mitigation Measures, refer to Chapter 3.

Chapter 5 **Comments and Coordination**

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process helping to determine the necessary scope of environmental documentation, the appropriate level of analysis, the type and magnitude of potential impacts and mitigation measures, and other related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal means, including project development team meetings, interagency coordination meetings, public information meetings, press releases, information update brochures, and consultation with Native American representatives. This chapter summarizes the results of Caltrans' efforts to identify, address, and resolve project-related issues through early and continuing coordination.

Early and Ongoing Coordination

Caltrans project management and various members of the project development team have regularly presented project information to the Mariposa County Board of Supervisors, the U.S. Forest Service, and public officials. Mariposa County officials and the U.S. Forest Service employees are interested in this project and support its construction.

Section 6002 Coordination with Public Agencies

Caltrans began coordinating with public agencies on the preparation of the Draft Environmental Impact Statement/Environmental Impact Report in February 2008 following the release of the Notice of Intent, which was published in the Federal Register on January 24, 2008. A Notice of Preparation was also circulated to public agencies on January 28, 2008.

During February 2008, letters of invitation were issued to public agencies that were either interested in the proposed project or would have a permitting responsibility on the project. The following agencies received invitations to be participating agencies:

- U.S. Environmental Protection Agency – formally accepted participating agency status and will provide comments on the environmental document.
- U.S. National Park Service Yosemite – formally accepted participating agency status, actively involved in project interagency meetings, and will provide comments on the environmental document.

- Bureau of Land Management – formally accepted participating agency status based on its responsibilities of managing and permitting river rafting activities, actively involved in project interagency meetings, and will provide comments on the environmental document.
- U.S. Forest Service – formally accepted participating agency status based on its Section 7 of the Wild and Scenic Rivers Act role as a river managing agency, actively involved in project agency meetings, and will provide comments on the environmental document.
- U.S. Army Corps of Engineers – formally accepted participating agency status based on its Clean Water Act Section 404 permitting responsibility, actively involved in project agency meetings, and will provide comments on the environmental document.
- California Department of Fish and Game – actively involved in project agency meetings based on its Section 1602 of the California Fish and Game Code permitting responsibility and will provide comments on the environmental document.
- California Regional Water Quality Control Board – formally accepted participating agency status based on its Clean Water Act Section 401 permitting responsibility and will provide comments on the environmental document.
- California Environmental Protection Agency – will be given the opportunity to provide comments on the environmental document.
- Mariposa County Board of Supervisors – formally accepted participating agency status based on its role as a local governing body, actively involved in project development meetings, and will provide comments on the environmental document.

Interagency meetings were held with specific public agencies for their involvement in the development of the purpose and need, a reasonable range of alternatives, and the methodology for analyzing impacts to the Merced River. Regular coordination also occurred with the public agencies. Descriptions of the meetings and coordination are described below. See Section 2.2 for a status of the permits and approvals.

Representatives from the following agencies were present at each of the interagency meetings:

- U.S. Forest Service
- Bureau of Land Management
- U.S National Park Service Yosemite
- U.S. Army Corps of Engineers
- California Department of Fish and Game

Interagency Meetings

Four meetings were held on the following dates:

February 13, 2008: Caltrans announced its role as lead agency for the preparation of the Draft Environmental Impact Statement/Environmental Impact Report and verified the roles of the agencies present. Concurrence on the purpose and need was obtained, and discussions were held on methods for addressing the Wild and Scenic Rivers Act. The agencies requested that Caltrans identify and analyze additional alternatives that avoid adversely affecting the Merced River. The agencies also requested that Caltrans initiate a recreational survey to determine the public's perception of how the proposed alternatives could affect the Merced River corridor.

April 30, 2008: Each agency discussed its individual comments on the Notice of Intent and explained that their comments on the Initial Study with Proposed Negative Declaration/Environmental Assessment should be used during the development of the Draft Environmental Impact Statement/Environmental Impact Report. Caltrans presented Alternatives A and T-3 as alternatives that would be analyzed for their viability and for their ability to avoid the Merced River. Caltrans discussed efforts it had made toward initiating a recreational survey and a river geomorphology report, and updating all other studies previously finalized.

November 19, 2008: Caltrans presented Alternatives E, A, and T-2 as alternatives considered and withdrawn. The agencies concurred as long as adequate documentation is provided. Alternative S-2 was presented as an alternative that would place piers above the ordinary high water mark of the river and avoid impacting limestone salamander habitat. The U.S. Forest Service confirmed that the ordinary high water is equal to the Q2 flow or 8871 cubic feet/second. Agencies further concurred that the No-build Alternative is the temporary detour and should be evaluated for its long-term effects on the project area. A status of the environmental studies and recreational survey was provided.

July 1, 2010: Caltrans provided an update to the cooperating/participating agencies by discussing the status of the draft environmental document, the anticipated scheduled release of the document, the public circulation process, and the finalization of the draft recreational survey report. All agencies concurred that the environmental document should be sent to the agencies at least two weeks in advance of the start of the circulation process to further promote coordination efforts. During the circulation process, the agencies will be reviewing the draft environmental document and the draft survey report. Following their reviews, comments will be provided on both documents. Caltrans will be conducting regular meetings with the agencies during the circulation process to facilitate quality reviews and address concerns with the draft environmental document.

Mariposa County Board of Supervisors

Caltrans staff has attended various board meetings to give regular updates on the Ferguson Slide Permanent Restoration project. The Mariposa County Board of Supervisors has been given regular opportunities to participate in the development of the project.

California Department of Fish and Game

March 2007: Caltrans received approval in email from Julie Vance for the proposed surveys for limestone salamander.

April 6, 2007: Caltrans requested the use of the Programmatic Streambed Maintenance Agreement for the geotechnical field operations.

April 13, 2007: Caltrans met with Julie Vance and Wendy Cabrera to tour the project site.

September 13, 2007: Caltrans met with Julie Vance and Laura Peterson-Diaz to request their concurrence that impacts to the limestone salamander would be completely avoided with implemented avoidance measures. Also discussed were mitigation measures for impacts to bats, oak woodland, and hardhead fish.

October 3, 2007: Received email from Laura Peterson-Diaz accepting Caltrans' proposal of avoidance and mitigation measures for bats, oak woodland, limestone salamander, and hardhead fish.

September 22, 2008: Caltrans discussed the effects of Alternatives R and T-3 on limestone salamander habitat. Caltrans requested that the California Department of

Fish and Game provide a letter stating that if any alternative presents a take on the limestone salamander habitat, then a permit could not be issued and that a waiver of the Fully Protected Species Act would need to be pursued for this project.

U.S. Army Corps of Engineers

February 1, 2007: Caltrans spoke with Tom Cavanaugh regarding the need for an individual permit if the Forest Service determines the project would have an adverse impact on the Merced River, which has a Wild and Scenic designation.

January 28, 2009: The U.S. Army Corps of Engineers participated in the Environmental Focus Group meeting as a cooperating agency on the project.

National Park Service

October 7, 2007: Caltrans spoke by phone with Lisa Acree regarding plant species the Park Service uses for erosion control, as well as the feasibility of collecting and growing local native seed to use on the Ferguson Slide Project.

July 22, 2010: The National Park Service, the U.S. Forest Service, and Caltrans discussed the process by which impacts to the outstandingly remarkable values would be evaluated. Any impacts to the outstandingly remarkable values are to be evaluated pursuant to the Wild and Scenic Rivers Act. A Section 7 evaluation will be prepared for each alternative describing the impacts. The evaluations are prepared by the U.S. Forest Service, which functions as the river administering agency. The Section 7 process of the Wild and Scenic Rivers Act is considered a separate analysis from the National Environmental Policy Act process.

National Oceanic and Atmospheric Administration Fisheries Service

October 9, 2007: Caltrans had a phone conference with Madelyn Martinez and Doug Hampton to discuss the potential for essential fish habitat at the project site. Both said they would have no jurisdiction over this project area.

The National Marine Fisheries Service issued a Draft Recovery Plan for Sacramento River winter-run Chinook salmon and Central Valley spring-run Chinook salmon. A potential recovery scenario would include the reintroduction of steelhead above the New Exchequer Reservoir on the main stem Merced River and on the South Fork Merced River. Prior to construction of any alternative, Caltrans would coordinate with the National Marine Fisheries Service with respect to the recovery plan.

U.S. Forest Service, Sierra National Forest

February 16, 2007: Caltrans submitted an operating plan for cultural work to the Forest Service for permitting purposes.

March 2007: Caltrans visited the Forest Service's district archaeologist's office to review cultural files of the project area.

April 10, 2007: Caltrans discussed the preparation of the Section 7(a) Wild and Scenic Rivers Act Evaluation with Dave Martin, District Ranger, and Jackie Diedrich of the U.S. Forest Service. The preparation should follow the guidance provided in the October 2004 Wild and Scenic Rivers Act technical document.

May 8, 2007: Caltrans talked with the Forest Service about the "outstandingly remarkable values" used to determine a project's effect on a Wild and Scenic River. These values should be applied to the discussion on the Merced River's Wild and Scenic River Evaluation as appropriate.

May 9, 2007: Caltrans met with Joanna Clines, Sierra National Forest botanist, at the project site to discuss potential project impacts to special-status plants, avoidance and mitigation measures, and Forest Service policies.

May 17, 2007: Caltrans spoke with Kevin Williams regarding the potential presence of special-status animals at the project site.

May 17, 2007: The Forest Service attended a pre-public information meeting to provide input on the Wild and Scenic Merced River informational display.

May 18, 2007: Caltrans requested a sensitive animal species list from Kevin Williams. Caltrans also forwarded the results of the surveys for limestone salamanders.

May 22, 2007: Caltrans received a sensitive plant list, noxious and invasive non-native weeds of concern list, and the weed prevention practices of the Forest Service.

June 14, 2007: Caltrans received a sensitive animal species list from the Forest Service.

July 25, 2007: The Forest Service suggested that the Bureau of Land Management should also be a reviewing agency of the Section 7(a) Wild and Scenic Rivers Act Evaluation. The Bureau of Land Management is responsible for issuing permits for

whitewater rafting on the Merced River. Also, various Forest Service specialists will be reviewing the evaluation.

July 26, 2007: Caltrans biology and landscape architecture staff met with Joanna Clines to discuss erosion control measures and post-construction plantings.

August 10, 2007: Caltrans sent the Forest Service a copy of the Public Information Meetings Summary Report.

August 21, 2007: The Forest Service informed Caltrans that they would be working with their Wild and Scenic River Coordinator on clearly defining the “outstandingly remarkable values.” These values should help Caltrans with the Section 7(a) analysis of the Merced River.

August 29, 2007: Caltrans and the Forest Service discussed the Merced River and whether it has been designated as recreational in terms of being a Section 4(f) resource or just for the purposes of a Wild and Scenic River. The Merced River was determined to be a 4(f) resource.

November 1, 2007: Caltrans provided the Forest Service with a copy of the Section 7(a) Merced Wild and Scenic River Evaluation for review. Comments will be provided once the review is complete.

November 5, 2007: The project development team held a meeting that included the Forest Service about the construction methods and restrictions to be used on this project.

November 6, 2007: Caltrans provided the Forest Service with a copy of the Ferguson Slide Permanent Restoration Project Draft Environmental Document.

November 9, 2007: Caltrans met with the Forest Service and the Bureau of Land Management to discuss impacts on the Merced Wild and Scenic River. The agencies requested that Caltrans initiate a recreational survey to determine impacts to the Merced River.

April – June 2008: Weekly coordination meetings were held with the U.S. Forest Service regarding the construction of the second temporary detour project. The U.S. Forest Service confirmed that for the purposes of the detour project, the Q2 flow would represent the ordinary high water mark of the river. Impacts to the river would be analyzed based on the Q2 boundary.

August 8, 2008: Caltrans met with the U.S. Forest Service to discuss final comments on the recreational survey plan and gain concurrence on the plan so that the survey could be implemented online and in the field.

September 19, 2008: Caltrans met with the U.S. Forest Service to discuss analyzing the 4(f) properties within the project area. Caltrans confirmed that the Merced River and Incline Road would be considered 4(f) properties.

November 21, 2008: Caltrans met with the U.S. Forest Service to confirm that the proposed alternatives are still subject to a wild and scenic river analysis even if they avoid encroaching into the Q2 flow. The analysis would determine if the alternatives impact the river in a manner that the U.S. Forest Service would find adverse.

April 17, 2009: Caltrans met with the U.S. Forest Service to discuss the preparation of the Individual Section 4(f) and the Wild and Scenic River section of the environmental document.

June 9, 2009: Caltrans design and structures engineers along with environmental staff met with the U.S. Forest Service at the project site to discuss proposed bridge construction methods and their effect on the Q2 flow of the river. Further discussions would be held to address mitigation for the construction methods.

March 16, 2010: Caltrans and the U.S. Forest Service discussed strategies for the review of the draft environmental document. The U.S. Forest Service has requested to receive the draft environmental document one to two weeks in advance of its release to the public. The U.S. Forest Service will provide comments on the document following the start of circulation and will also be conducting a concurrent review for the draft recreational survey report. This review is being conducted at the same time as the document because the survey report will aid in the preparation of the draft Section 7 evaluations. The public circulation process may require up to a 90-day review. The U.S. Forest Service is also requesting that a series of meetings take place at the start of the circulation period, which would involve discussing conceptual design plans. This would facilitate a better review process.

The U.S. Forest Service would be preparing draft Section 7 evaluations absent of determinations for each alternative. These evaluations would also be done during the circulation of the draft environmental document. Both the environmental document and the recreational survey report will be used for the preparation of these evaluations. Caltrans confirmed that Section 7 determinations (not evaluations) would

be required for each alternative if the U.S. Army Corps of Engineers requests them from the U.S. Forest Service. An alternative would typically require a Section 7 determination if that alternative impacts the river below the ordinary high water mark. This criterion applies to the Wild and Scenic River analysis and not the NEPA analysis. The U.S. Forest Service will be evaluating impacts to the outstandingly remarkable values within the Wild and Scenic Corridor even if determinations are not required for certain alternatives or regardless of whether the Army Corps of Engineers requests a determination. This type of analysis is also part of the Wild and Scenic Rivers Act and is not a NEPA analysis.

May 19, 2010: Caltrans and the U.S. Forest Service discussed the Sierra National Forest Land and Resource Management Plan. The goals and management objectives were incorporated into the draft environment document.

June 22, 2010: Caltrans presented the project purpose, description, and proposed alternatives to the new Sierra National Forest Supervisor. The supervisor felt that the cost of the project as well as traffic safety would be important factors to consider when Caltrans selects a preferred alternative.

Bureau of Land Management

October 8, 2007: Caltrans provided the Bureau of Land Management with the proposed alternatives for the project for review.

November 1, 2007: Caltrans provided the Bureau of Land Management a copy of the Section 7(a) Merced Wild and Scenic River Evaluation for review.

November 6, 2007: Caltrans provided the Bureau of Land Management a copy of the Ferguson Slide Permanent Restoration Project Draft Environmental Document.

November 7, 2007: Caltrans talked with Bureau of Land Management about rafting regulations and safety within the project area. Comments on the Section 7(a) Merced Wild and Scenic Rivers Act Evaluation will be provided with regard to the rafting usage of the river.

August 20, 2008: Caltrans held discussions with the Bureau of Land Management, the U.S. Forest Service, and Kelly Bricker, Ph.D. (the consultant performing the recreational survey). The agencies provided comments on the proposed recreational survey plan.

June 9, 2009: Caltrans design and structures engineers along with environmental staff met with the Bureau of Land Management at the project site to discuss proposed bridge construction methods and their effect on the Q2 flow of the river. Further discussions would be held to address mitigation for the construction methods.

State Office of Historic Preservation

September 5, 2007: Caltrans sent the completed Historic Property Survey Report, which contained the finding of effect to the State Historic Preservation Officer.

October 10, 2007: The State Historic Preservation Officer concurred with the findings presented in the Historic Property Survey Report.

Coordination with Native American Groups

Native American Heritage Commission

June 26, 2006: Caltrans contacted Debbie Pilas-Treadway about the project. Caltrans was asked to notify several Native American communities and individuals.

Native American Tribes, Groups, and Individuals

June 27, 2006 and May 29, 2007: Caltrans sent letters about the project to the following groups or individuals:

- Anthony C. Brochini, Tribal Chair, American Indian Council of Mariposa County
- Randy Sales, Southern Sierra Miwuk
- Michelle Demirs, Tribal Administrator, North Fork Mono Rancheria
- Shannon Brawley, Executive Director, California Indian Basket Weavers Association
- Ron Goode, Tribal Chair, North Fork Mono Tribe
- Robert Cox, Cultural Resources Director, Tuolumne Band of Me-Wuk
- Alex Flores, Environmental Department, North Fork Mono Rancheria
- Reba Fuller, Central Sierra Me-Wuk Cultural and Historical Preservation Committee
- Judy Fink, Tribal Chair, North Fork Mono Rancheria

August 9, 2007: Caltrans attended a Tribal Council meeting held by the American Indian Council of Mariposa County. Caltrans staff presented the proposed alternatives and addressed questions.

January 3, 2008: Caltrans attended a Tribal Council meeting held by the American Indian Council of Mariposa County. Caltrans staff collected comments on the project from the Tribal Council and announced the preparation of a Draft Environmental Impact Statement/Environmental Impact Report.

December 4, 2008: Caltrans attended a Tribal Council meeting held by the American Indian Council of Mariposa County. Caltrans staff presented the proposed alternatives and addressed questions.

Public Participation

Public Information Meetings

May 23, 2007: Caltrans held a public information meeting in the Board of Supervisors Chambers at the Mariposa County Government Center in Mariposa. Caltrans staff planned and implemented the public information meeting to conform to the requirements of applicable federal and state laws, including the National Environmental Policy Act and California Environmental Quality Act.

This meeting was the first of two public information meetings and was publicized through a direct mail announcement to residents, local businesses, public agencies, and other interested parties. Caltrans sent letters of invitation to federal, state, and local elected officials. A public notice for the meeting appeared in the *Mariposa Gazette* on May 10 and May 17, 2007.

Approximately 68 residents and interested parties attended. Caltrans provided each attendee with an information sheet containing a project map, an illustration of the project location, a project description, the project cost and purpose, background information, funding sources, and a project timeline. Caltrans explained the format of the public information meeting, and attendees were encouraged to ask questions of the project team. Information stations containing project maps, graphics, and display boards were located around the meeting room. Caltrans personnel were available at each information station to explain the displays and answer questions. Attendees were encouraged to submit written comments. All informational displays presented at the meeting have been made available on the Caltrans District 10 website.

Caltrans received 31 comments from the Mariposa meeting. A majority of the comments received from this meeting showed a preference for Alternative S.

May 29, 2007: Caltrans presented local officials with information on the project in the Board of Supervisors Chambers at the Mariposa County Government Center in

Mariposa. The purpose of and materials presented at this meeting were the same as those presented at the Mariposa and El Portal public information meetings.

June 12, 2007: Caltrans held a second public information meeting at the El Portal Community Center (Clark Hall) in El Portal. The notice for this second public information meeting was distributed through the Yosemite National Park Public Information Officer. The public notice was also distributed throughout the communities of Briceburg, Midpines, El Portal, and Mariposa.

Approximately 63 residents and interested parties attended. This meeting was presented in the same format as the one held in Mariposa. Caltrans received 45 comments from the El Portal meeting. A majority of the comments received from this meeting showed a preference for Alternative R.

November 28, 2007: Caltrans held a public hearing in the Board of Supervisors Chambers at the Mariposa County Government Center in Mariposa. The purpose of the meeting was to gather comments on the Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment, which had circulated on November 19.

The public hearing was publicized through direct mail announcements sent to residents, local businesses, public agencies, and other interested parties. Caltrans sent letters of invitation to federal, state, and local elected officials. A public notice for the hearing appeared in local newspapers. It appeared in *The Mariposa Gazette* on November 15 and November 22 and in *The Merced Sun-Star* on November 16. The public notice was also distributed throughout the communities of Midpines, El Portal, and Mariposa. Approximately 59 residents and interested parties attended the public hearing on November 28, 2007 in Mariposa.

November 29, 2007: Caltrans held a public hearing at the El Portal Community Center in El Portal. The purpose of the meeting was to gather comments on the Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment, which had circulated on November 19.

The public hearing was publicized through direct mail announcements sent to residents, local businesses, public agencies, and other interested parties. Caltrans sent letters of invitation to federal, state, and local elected officials. A public notice for the hearing appeared in local newspapers. It appeared in *The Mariposa Gazette* on November 15 and November 22 and in *The Merced Sun-Star* on November 16. The

public notice was also distributed throughout the communities of Midpines, El Portal, and Mariposa. Approximately 49 residents and interested parties attended the hearing on November 29, 2007 in El Portal.

Caltrans received 81 comments from the Mariposa and El Portal meetings. A majority of the comments received from these meetings showed concerns about the project's impact on the Merced River.

May 21, 2008: Caltrans held a public information meeting in the Board of Supervisors Chambers at the Mariposa County Government Center in Mariposa. Caltrans staff planned and implemented the public information meeting to inform the public that Caltrans is preparing a Draft Environmental Impact Statement/Environmental Impact Report for the project and present the proposed alternatives and purpose and need.

The public information meeting was publicized through a direct mail announcement to residents, local businesses, public agencies, and other interested parties. Caltrans sent letters of invitation to federal, state, and local elected officials. A public notice advertising the meeting appeared in the *Mariposa Gazette* on May 8 and 15, 2008, and the *Merced Sun Star* on May 14, 2008. The notice was also distributed through the Yosemite National Park Public Information Officer.

May 22, 2008: Caltrans held a public information meeting at the El Portal Community Center in El Portal. Caltrans staff planned and implemented the public information meeting to inform the public that Caltrans is preparing a Draft Environmental Impact Statement/Environmental Impact Report for the project and present the proposed alternatives and purpose and need. The public information meeting was publicized through a direct mail announcement to residents, local businesses, public agencies, and other interested parties. Caltrans sent letters of invitation to federal, state, and local elected officials. A public notice advertising the meeting appeared in the *Mariposa Gazette* on May 8 and 15, 2008, and the *Merced Sun Star* on May 14, 2008. The notice was also distributed through the Yosemite National Park Public Information Officer.

River Rafting Companies

July 17, 2007: Following the public information meetings for the project, Caltrans received comments from Zephyr Whitewater Expeditions. Concerns were expressed about having the proposed bridges span the entire river if possible or to avoid placing

the piers in the middle of the river. In addition, it would be important for the project to avoid negatively affecting the rafting season, typically April through July.

Environmental Focus Group

January 28, 2009: Caltrans met with representatives from Friends of the River, Sierra Club-Tehipite Chapter, Sierra Club, National Park Service, Sierra Nevada Conservancy, Mariposa County Economic Development, Mariposa County Board of Supervisors, Transportation Involves Everyone, Sierra Sun Times, Mariposans for the Environment and Responsible Government, and the U.S. Army Corps of Engineers.

A brief overview of the project history was given, and a consensus on the purpose and need was established. The proposed build alternatives, No-build Alternative, and alternatives considered but withdrawn were presented. The anticipated environmental document schedule was provided along with the status of the environmental studies. Open discussions were held on the Wild and Scenic Rivers Act and its relevance to the proposed project and the purpose for Caltrans implementing the recreational survey.

Recreational Survey

At the request of the U.S. Forest Service and the Bureau of Land Management, Caltrans initiated a Recreational Survey designed to capture the opinions of recreational stakeholders such as whitewater rafters, campers, hikers, bikers, and anglers as well as the general public with regards to the proposed project alternatives' impacts on the recreational value of the Merced River. The survey began in 2008 and continued through the rafting season in 2009. Caltrans, the U.S. Forest Service, and the Bureau of Land Management agree that the data collected from the survey will be used during the preparation of the Final Environmental Impact Statement/ Environmental Impact Report and for the selection of a preferred alternative.

Chapter 6 List of Preparers

This document was prepared by the following Caltrans Central Region staff and consultants:

Caltrans Staff

Allam Alhabaly, Transportation Engineer (Civil). B.S., School of Engineering, California State University, Fresno; Noise specialist since 2001. Contribution: preparation of Noise Report.

John Bowman, Senior Engineering Geologist. Contribution: Geotech Team Leader and Geotechnical Report preparation.

Rebecca J. Bakhdoud, Transportation Engineering Technician. B.A., Liberal Studies; Minor in Mathematics, California State University, San Bernardino; 10 years of CADD, Engineering Support and Graphics experience. Contribution: Document Mapping and Graphics.

Carrie Blickenstaff, Associate Environmental Planner (Natural Sciences). B.S., Biology, California State University, Fresno; 10 years of biology experience. Contribution: Biological surveys and preparation of Natural Environment Study.

Jon L. Brady, Associate Environmental Planner/Architectural Historian. B.A., Political Science and Anthropology; M.A., History, California State University, Fresno; over 28 years of experience as a consulting archaeologist and historian. Contribution: Historic Resources Evaluation Report.

Anthony Cipponeri, P. E., District Hydraulics Engineer, Caltrans District 10, Stockton, California. Contribution: Location Hydraulic Study.

Rajeev Dwivedi, Associate Engineering Geologist. Ph.D., Environmental Engineering, Oklahoma State University, Stillwater; 18 years of environmental technical studies experience. Contribution: Preparation of Water Quality Assessment and Air Report.

Sarah Gassner, Office Chief, Central Region North. Contribution: Supervising Environmental Planner.

Susan Greenwood, Associate Environmental Planner. B.S., Environmental Health Science, California State University, Fresno; 19 years environmental health, hazardous waste, and hazardous material management experience.

Contribution: Hazardous waste surveys and coordination of Initial Site Assessment.

Peter Hansen, Engineering Geologist, P.G. B.S., Geology, California State University, Fresno; 1 year hazardous waste experience, 9 years paleontology/geology experience. Contribution: Preparation of Paleontological Identification Report.

Joseph Llanos, Graphic Designer III. B.A., Graphic Design, California State University, Fresno; 14 years visual design and public participation experience.

Contribution: Preparation of environmental document graphics and public informational displays and materials.

Grace Magsayo, P.E., Senior Transportation Engineer. B.S., Civil Engineering, California Polytechnic State University, San Luis Obispo; 11 years in civil engineering. Contribution: Project Management.

Patricia Teczon, Associate Transportation Engineer (Specialist), Professional Engineer in Civil Engineering. B.S., Civil Engineering, University of the Pacific, Stockton; 27 years of experience in project development and design. Contribution: Project Engineer and development of Project Report, plans, specifications, and estimate.

Matthew Voss, Associate Environmental Planner. B.S., Biological Sciences, California State University, Fresno; 9 years of environmental planning and document writing experience. Contribution: Environmental planning coordinator and document preparation.

Brian Wickstrom, Associate Environmental Planner (Archaeologist). M.A., Cultural Resource Management, Sonoma State University (1986); 25 years of professional archeological experience. Contribution: Cultural Resources Specialist for prehistoric resources and preparation of Historical Property Survey Report.

Consultants

Balance Hydrologics, Inc. Mark Strudley, Ph.D., Greg Guensch, P.E., M.S., Shawn Chartrand, C.E.G., M.S., Benjamin Roberts, Ph.D., P.E. Contribution: River Geomorphology Report.

Parsons Transportation Group, Inc. Jeff Lormand, Principal Landscape Architect. Contribution: Visual Impact Assessment

Parsons Transportation Group, Inc. Allison Colwell, Ph.D. Contribution: Botanical Report.

Parsons Transportation Group, Inc. Theodore J. Papenfuss, Ph.D., Contribution: Limestone Salamander Biological Report.

Parsons Transportation Group, Inc. Sean M. Rovito, M.S. Contribution: Limestone Salamander Biological Report.

Kelly S. Bricker, Associate Professor. University of Utah Department of Parks, Recreation, and Tourism. Contribution: Recreational Survey Data Collection and Report.

Chapter 7 Distribution List

Table 7.1 lists the recipients of the Notice of Availability of the Draft Environmental Impact Statement/Environmental Impact Report.

Table 7.1 Name and Affiliation of Notice of Availability Recipients

First Name	Last Name	Title	Organization
Michael E.	Lichtenstein		Gateway Community Resident
Michael J.	Tollefson	Superintendent	U.S. National Park Service Yosemite
Jim	Wilson	Chief	Mariposa County Fire Department
Gary	Walker		Transportation Involves Everyone
Candy	O'Donel Browne		EDC
Bradford	Aborn	Supervisor	Mariposa County Board of Supervisors, District 1
Lou	Carter		El Portal Market
Elijah	Meeks		University of California, Merced
Jeanetta	Phillips		Local Business Property Owner
Leroy	Radanovich		Yosemite-Mariposa Co. Tourism Bureau
Ruth L.	Sellers		
Greg	Fritz		Happy Burger Diner
Marilyn	Lidyoff		Mariposa County Economic Development
Dianne	Fritz	Supervisor	Mariposa County Board of Supervisors, District 4
Janet	Bibby	Chairman	Mariposa County Board of Supervisors, District 3
Dave	Cogdill	Senator	California State Senate, 14 th District
Richard C.	Hutchinson		
Kenneth A.	Gosting	Executive Director	Transportation Involves Everyone
Ann	Roberts		
Alison	Colwell	Botanist	Parsons Transportation Group Inc.
Greg	Adair		Friends of Yosemite Valley
George	Whitmore	Chairman	Sierra Club's Yosemite Tehipite Committee
David	Andrews	Chairman	Yosemite-Mono Lake Paiute Indian Community
Bridget	Kerr		
Laurel	Anderson		El Portal Town Planning Committee
Vicki	McMichael	Program Manager	DNC Parks & Resorts - Yosemite, Inc.
Dick	Whittington	Manager	YARTS
Kris	Schenk	Director	Mariposa County Planning
Dana S.	Hertfelder	Director	Mariposa County Public Works
Laura	Whitney		U. S. Army Corp of Engineers
Paul	Maniccia		U.S. Army Corp of Engineers
Dorothy	Kuhnel	Executive Director	Mariposa Chamber of Commerce
Elnora	George	CFO	John C. Fremont Healthcare District
Joanna	Clines	Forest Botanist	U. S. Forest Service
Kevin	Shelton		Mariposa Tourism Advisory Council
Julie	Vance	Senior Environmental Scientist	California Department of Fish and Game
Laura	Peterson-Diaz		California Department of Fish and Game
Roger	Biery		Economic Development Corporation of Mariposa
Dr. Patrick	Holland		Mariposa County Unified School District

First Name	Last Name	Title	Organization
George	Radanovich	U. S. Representative	U. S. House of Representatives
Barbara	Boxer	Senator	U. S. Senate
Dianne	Feinstein	Senator	U. S. Senate
Tom	Berryhill	Assembly Member	California State Assembly
Lyle	Turpin	Supervisor	Mariposa County Board of Supervisors, District 2
Jim	Allen	Supervisor	Mariposa County Board of Supervisors, District 5
Lt. Jennie	Baldon		Mariposa County CHP
Adrienne	Freeman		U.S National Park Service Yosemite
Rick	Benson	County Administrative Officer	Mariposa County
Dave	Martin	District Ranger	U. S. Forest Service
Teri	Drivas	Lands and Recreation Officer	U. S. Forest Service
Randy	Sales		Southern Sierra Miwuk
Judy	Fink	Tribal Chair	North Fork Mono Rancheria
Reba	Fuller	Monitor	Central Sierra Me-Wuk, Tuolumne Band of Me-Wuk, Cultural and Historical Preservation Committee
Alex	Flores		North Fork Mono Rancheria
Robert	Cox	Cultural Resources Director	Tuolumne Band of Me-Wuk
Ron	Goode	Tribal Chair	North Fork Band of Mono Indians
Shannon	Brawley	Executive Director	California Indian Basket Weavers Association
Michelle	Demirs	Tribal Administrator	North Fork Mono Rancheria
Anthony	Brochini	Tribal Chair	American Indian Council of Mariposa County Mariposa Museum & History Center Mariposa County APCD
Curtis	Riggs	President	VIA Adventures
Bob	Linnenan		Mariposa Gazette
Bob	Ferguson	President	Zephyr Whitewater Expeditions
Tolley	Gorham		Mariposa Properties Tuolumne County Visitor's Bureau
Tracy	Rogge	Vice President of Operations	Delaware North Company
Ceslie	Brandon		Miner's Inn 49er Market
Lisa	Green		Mother Lode Lodge Mariposa County Library
Jesse	Figueroa		Mercy Medical Transportation, Inc.
Dieter	Dubberke		Pioneer Market Martha's Boutique Gift Gallery
Niki	Nicholas, Ph. D	Chief, Resources Management & Science	U. S. National Park Service Yosemite
Mark	Butler		U. S. National Park Service Yosemite All Outdoors Rafting American River Recreation ARTA Whitewater Rafting Mariah Wilderness Expeditions O.A.R.S. Inc.

First Name	Last Name	Title	Organization
			Whitewater Excitement Whitewater Voyages
Glen	Rothell		
Nancy	Biskovich		
Millie	Card		Southern Sierra Miwok
Evelyn	Wilson		Southern Sierra Miwok
Lisa	Townsend		Southern Sierra Miwok
Paul	Vasquez		Southern Sierra Miwok
Sandra	Chapman		Southern Sierra Miwok
Richard	Hogan		Southern Sierra Miwok
Winona	Brewn		American Indian Council of Mariposa County
Susie	Liard		American Indian Council of Mariposa County
Shirley	Forga		American Indian Council of Mariposa County
	Leonard		Southern Sierra Miwok
	Harlow		Southern Sierra Miwok
	Alberta		Southern Sierra Miwok
Dale	Thomas		
Andrea	Canapary		
Steve	Thompson		
Jim	McDonald		
Cynthia	Aborn		
Keith	Williams		Mariposa County Tax Collector
Diane	Mansilal		
Brittany	Wolderski		
Catherine	Collamer		
Eleanor	Keuning		
Catherine	Aborn		
Irene	Aborn		
Paul and Heidi	Raggio		Merced Fruit Barn
Lorinda	Forrest		
James C.	Tucker		
Liz	Skelton		
Jeff	Maurer		
Caroline	McGroth		Yosemite Bug Rustic Mountain Resort
Sue	Clark		
Mark	Deglomine		
Ruth	Middlecamp		
Witt O.	Hawkins		
Roger	Mitchell		
Paul C.	Ballard		
Joe	Ballard		
Leslie	Chow		
Sue	Beatty		
Ronald	Stork		Friends of the River
Gretchen	Stromberg		
Pete	Devine		
Andrew	Chambers		
Marti	Gerdes		
Kristina	Rylands		
Ron	Mackie		
Martin	Acree		
Dr. David	Cehrs		
Alex	Crespi		
Bart	Brown, M.D.		Mariposans for the Environment and

First Name	Last Name	Title	Organization
William	Tucker		Responsible Government
Edward C.	Cole		Southern Sierra Miwok
William	Haigh		U.S. Forest Service
Jim	Eicher		Bureau of Land Management
			Bureau of Land Management
			State Clearing House
Dale	Harvey		California Regional Water Quality Control Board
Clifton	Meek		U. S. Environmental Protection Agency
Mandy	Vance		Sierra Nevada Conservancy
			Upper Merced Watershed Council
Annette	Allsap		Sierra Club
K. John	Flaherty		Sierra Club's Yosemite Tehipite Committee
Jen	Nersesian		U. S. National Park Service
John	Brady		Mariposans for the Environment and Responsible Government
Mike	McClelan		Transcom

Appendix A California Environmental Quality Act Checklist

The following checklist identifies physical, biological, social, and economic factors that might be affected by the proposed project. The California Environmental Quality Act impact levels include “potentially significant impact,” “less than significant impact with mitigation,” “less than significant impact,” and “no impact.”

Supporting documentation of all California Environmental Quality Act checklist determinations is provided in Chapters 3 and 4 of this Environmental Impact Report/Environmental Impact Statement. Documentation of “No Impact” determinations is provided at the beginning of Chapters 3 and 4. Discussion of all impacts, avoidance, minimization, and/or compensation measures is under the appropriate topic headings in Chapters 3 and 4.

Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
--------------------------------	--	------------------------------	-----------

I. AESTHETICS: Would the project:

- | | | | | |
|---|--------------------------|-------------------------------------|--------------------------|-------------------------------------|
| a) Have a substantial adverse effect on a scenic vista | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Substantially degrade the existing visual character or quality of the site and its surroundings? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

- | | | | | |
|--|--------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d) Result in the loss of forest land or conversion of forest land to non-forest use? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Conflict with or obstruct implementation of the applicable air quality plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d) Expose sensitive receptors to substantial pollutant concentrations? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e) Create objectionable odors affecting a substantial number of people? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

IV. BIOLOGICAL RESOURCES: Would the project:

- | | | | | |
|--|-------------------------------------|--------------------------|--------------------------|-------------------------------------|
| 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? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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V. CULTURAL RESOURCES: Would the project:

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d) Disturb any human remains, including those interred outside of formal cemeteries? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

VI. GEOLOGY AND SOILS: Would the project:

- | | | | | |
|--|--------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| ii) Strong seismic ground shaking? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| iii) Seismic-related ground failure, including liquefaction? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| iv) Landslides? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Result in substantial soil erosion or the loss of topsoil? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

VII. GREENHOUSE GAS EMISSIONS: Would the project:

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

An assessment of the greenhouse gas emissions and climate change is included in the body of environmental document. While Caltrans has included

Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

this good faith effort in order to provide the public and decision-makers as much information as possible about the project, it is Caltrans' determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct and indirect impact with respect to climate change. Caltrans does remain firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the body of the environmental document.

VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

IX. HYDROLOGY AND WATER QUALITY: Would the project:

a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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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) Result in inundation by seiche, tsunami, or mudflow?

X. LAND USE AND PLANNING: Would the project:

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?

XI. MINERAL RESOURCES: Would the project:

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?

Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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XII. NOISE: Would the project result in:

- | | | | | |
|---|--------------------------|-------------------------------------|--------------------------|-------------------------------------|
| a) 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| (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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

XIII. POPULATION AND HOUSING: Would the project:

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| 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)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

XIV. PUBLIC SERVICES:

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Would the project 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 any of the public services: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Fire protection? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Police protection? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Schools? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Parks? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Other public facilities? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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XV. RECREATION:

- a) Would the project 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) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

XVI. TRANSPORTATION/TRAFFIC: Would the project:

- a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?
- b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?
- 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) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:

- 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?

Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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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?

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project 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, substantially 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) Does the project 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) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Appendix B Section 4(f) Evaluation

The environmental review, consultation, and any other action required in accordance with applicable federal laws for this project are being, or have been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S. Code 327.

A River Geomorphology Report, January 2009, a revised Natural Environment Study, January 2009, a Historic Properties Survey Report, September 2007, and Visual Impact Assessment, April 2009 were used to determine potential impacts to the Section 4(f) resources as a result of the proposed project.

Introduction

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at 49 U.S. Code, Section 303, declares that “it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.”

Section 4(f) specifies that the Secretary [of Transportation] may approve a transportation program or project...requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if:

- 1) There is no prudent and feasible alternative to using that land; and
- 2) The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

Section 4(f) further requires consultation with the Department of the Interior and, as appropriate, the involved offices of the Departments of Agriculture and Housing and Urban Development in developing transportation projects and programs that use lands protected by section 4(f). If historic sites are involved, then coordination with the State Historic Preservation Officer is also needed.

Description of Proposed Project

Caltrans proposes to restore full highway access between the communities of Mariposa and El Portal via State Route 140 in Mariposa County, by repairing or permanently bypassing the portion of the highway that was damaged by the Ferguson rockslide. Restoration of State Route 140 would eliminate the detour and provide full access to all traffic on State Route 140 between the town of Mariposa and Yosemite National Park. Refer to Chapter 1 for more information on the project purpose and need.

Currently, motorists must use a temporary, single-lane detour route to travel this portion of State Route 140. Restoration of State Route 140 would provide full access to all traffic using State Route 140 between the town of Mariposa and Yosemite National Park. The detour was designed to be a temporary solution, and an agreement exists with the U.S. Forest Service that the structures used for the detour would be removed once a permanent solution could be constructed.

With the initial closure of the highway, approximately 2.5 hours were added to a one-way trip to and from the Mariposa and Yosemite areas. Distances between 70 and 90 miles were added to the commutes of motorists. Motorists had to travel on State Routes 41 or 120, which are windier, longer, and more often subject to harsh weather conditions during winter months. When the original temporary detour opened on August 18, 2006, vehicles 28 feet in length or less would still encounter delays up to 15 minutes in either direction by a stoplight that controlled one-way traffic on the one-lane detour.

With the new temporary bridges, vehicles up to 45 feet in length were once again able to use the highway; however, the temporary bridges are not considered permanent and will eventually fail due to the normal wear and tear, or be washed away in a flood, or removed due to deterioration. The temporary bridges may not be repaired or replaced pursuant to an agreement with the U.S. Forest Service. The closure of the highway would negatively affect Mariposa County as well as Yosemite National Park since they rely heavily on full access for many types of transportation that serve tourism and residents of the area. State Route 140 is essential in supporting the Mariposa County and Yosemite communities because the route is used for supplying goods and services.

The following alternatives are being proposed:

Alternative C (Open-Cut Realignment)

This alternative would realign the highway to the northeast, spanning the Merced River and bypassing the rockslide. State Route 140 would cut through the mountain across from the rockslide and then span back across the river where it would meet the existing alignment. Two bridges would be constructed to cross the river. The bridges would be constructed with concrete, and the lengths of the bridges would be 550 feet and 650 feet. The highway would be constructed with two 12-foot lanes and 8-foot outside shoulders. The estimated cost for this alternative would be \$53.0 million in 2009 dollars. See the cross-section in Appendix F.

Alternative T (Tunnel Realignment)

This alternative would realign the highway to the northeast, spanning the Merced River and bypassing the rockslide. State Route 140 would tunnel 700 feet through the mountain across from the rockslide and then span back across the river where it would meet the existing alignment. Two bridges would be constructed to cross the river. The bridges would be constructed with concrete, and the lengths of the bridges would be 550 feet and 650 feet. The highway and tunnel would be constructed with two 12-foot lanes and 8-foot outside shoulders. The tunnel would also contain two 4-foot emergency walkways. The estimated cost for this alternative would be \$79.8 million in 2009 dollars. See the cross-section in Appendix F.

Alternative S (Viaduct Realignment)

This alternative would realign the highway to the northeast, spanning the Merced River with two bridges and bypassing the rockslide with a hillside viaduct and retaining wall. The bridges would be constructed with concrete and the lengths of the bridges would be 805 feet and 725 feet. The viaduct and retaining wall section would be 358 feet long and supported by a terrace on the hillside and columns. The highway would be constructed with two 12-foot lanes and 8-foot outside shoulders. The estimated cost for this alternative would be \$33.7 million in 2009 dollars. See the cross-section in Appendix F.

Alternative S-2 (Modified Viaduct Realignment)

This alternative is similar to Alternative S and would realign the highway to the northeast, spanning the Merced River with two bridges and bypassing the rockslide with a hillside viaduct and retaining wall. This alternative differs from Alternative S in that it proposes two different bridge-type variations along with their own specific roadway alignments. The variations are referred to as S2-V1 and S2-V2 and described below:

Variation S2-V1

This variation would construct two tied-arch bridges. A tied-arch bridge uses an arch structure with cables placed above the bridge deck for support. The lengths of the S2-V1 tied-arch bridges would be 700 feet and 790 feet. The viaduct between the two bridges would be 510 feet in length. A 10-foot-wide rockfall area would be constructed in between the roadway and cut slope. The highway would be constructed with two 12-foot lanes and 8-foot outside shoulders. See the cross-section in Appendix F. The estimated cost for variation S2-V1 would be \$92.2 million in 2009 dollars.

Variation S2-V2

This variation would construct two slant-leg bridges. A slant-leg bridge uses “V”-shaped columns to support the bridge deck. The slant-leg bridge may also be referred to as a V-Bent bridge. The lengths of the S2-V2 slant-leg bridges would be 860 feet and 700 feet. The viaduct between the two bridges would be 65 feet in length. A 10-foot-wide rockfall area would be constructed in between the roadway and cut slope. The highway would be constructed with two 12-foot lanes and 8-foot outside shoulders. See the cross-section in Appendix F. The estimated cost for variation S2-V2 would be \$37.9 million in 2009 dollars.

Alternative T-3 (Tunnel Under Slide Realignment)

This alternative would realign the highway by tunneling under the area of the slide. The tunnel would be 2,200 feet long, provide two 12-foot lanes, 8-foot outside shoulders and two 4-foot emergency walkways. The estimated cost for this alternative would be \$178.8 million in 2009 dollars. See the cross-section in Appendix F.

Alternative R (Rockshed/Tunnel)

This alternative would construct a rockshed (cut and cover tunnel) through the talus (rock debris) of the slide along the existing State Route 140 alignment. The rockshed would be 760 feet long, provide two 12-foot lanes, 8-foot outside shoulders and a 4-foot emergency walkway. The rockshed would be a reinforced concrete box structure supported on 20-foot-long concrete piles and anchored with tie-backs into the west canyon wall. The estimated cost for this alternative would be \$78.5 million in 2009 dollars. See the cross-section in Appendix F.

No-build Alternative

The No-build Alternative would leave State Route 140 damaged and blocked by the Ferguson rockslide. As a result of the No-build Alternative, the temporary detour would become the permanent State Route 140 alignment. The traffic signals controlling the single-lane access through the detour would remain in operation.

The detour was constructed during a declared emergency as a temporary solution to the closure of State Route 140. It was designed under an agreement with the U.S. Forest Service that the pavement and structures used for the detour would be removed once a permanent solution could be constructed. The No-build Alternative requires the same environmental analysis as the proposed permanent build alternatives and was evaluated for its long-term impacts.

The temporary bridges and the structures that support them vary as to the length of their service life, depending on environmental conditions. The actual steel bridges themselves may have a useful life of between 20 and 25 years. This estimate is based on normal wear, fatigue, and corrosion of the steel components. The structures supporting the temporary bridges have a service life of 5 to 10 years. These support structures are actually what determine the useful age of the detour route, and the fact that they could be overrun with flood waters in the event of a heavy precipitation year leave the area vulnerable to loss of highway access. The agreement with the U.S. Forest Service has no option allowing the reconstruction of the temporary detour bridges. When they fail, which will be within a decade due either to flooding or general wear, State Route 140 will be permanently severed in the absence of a permanent solution.

Refer to Chapter 2 for more information on the project description and project alternatives.

List and Description of Section 4(f) Properties

Two Section 4(f) resources have been identified within the project area. Those resources are the Merced River, which is designated as a Wild and Scenic River, and Incline Road, which is used as a recreational trail.

The Merced River originates in the High Sierra of Yosemite National Park. The river collects its water from Mount Hoffman, Mount Raymond, Tenaya Lake, and the Cathedral Range and flows freely into Yosemite Valley. The Merced River creates deep canyons as it continues through the Sierra and Stanislaus national forests. The river eventually makes its way down into the San Joaquin Valley.

The Merced River has two major branches. The main river branch goes through Yosemite Valley. The South Fork branch starts at the southern portion of Yosemite and flows through some of the wildest and least developed land in the Sierra National Forest before it joins the main branch just upstream of the Ferguson rockslide.

Development near the Merced River, including the former Yosemite Valley Railroad line (now Incline Road and the temporary State Route 140 detour), occurred because of the river's proximity to Yosemite National Park. The designation in 1987 as a federal Wild and Scenic River was sought to protect the largely undeveloped river from further development to preserve the wild, scenic, and recreational characteristics.

The segment of the Merced River that flows through the project area is classified as recreational because of the presence of the highway and Incline Road and the recreational activities that the river supports. This 5.5-mile segment extends from the confluence of the South Fork Merced River to the northwest boundary of the Sierra and the southeast boundary of the Stanislaus national forests. The river here is free flowing; the slopes alongside it are sparsely vegetated, making the river highly visible to the traveling public. Whitewater boating, fishing, and picnicking are popular activities along this part of the Merced River.

The U.S. Forest Service is responsible for the administration of this recreationally classified segment. The Bureau of Land Management, through a Memorandum of Understanding and Letter of Agreement with the U.S. Forest Service, is the lead agency for managing whitewater boating. In addition to issuing permits, the Bureau of Land Management maintains and monitors the permit system on the Merced River. All issues affecting the recreational value of the river would be reported to the U.S. Forest Service. The outstandingly remarkable values of the Merced Wild and Scenic River within the project area are geology, recreation, wildlife, vegetation, and cultural/historical benefits.

The limestone salamander, which makes up the outstandingly remarkable value of wildlife and contributes to the Merced River's designation as a Wild and Scenic River and its recreational classification, was designated as a threatened species by the State of California in 1971. The threatened designation by the State of California indicates that the species is at a high risk of extinction due to restricted range and few populations. The species is only found within the Merced River Canyon. It is also

designated as a fully protected species pursuant to the California Fish and Game Code Section 5050.

The 4(f) property boundary is equivalent to the Wild and Scenic Rivers boundary of this recreational segment of the Merced River. The boundary encompasses ¼ mile from each side of the river throughout the 5.5-mile segment and is contained within steep canyon walls.

Incline Road (formerly the Yosemite Valley Railroad line) functioned as a railroad line from 1907 to 1945, providing access for tourists to Yosemite National Park and exploitation of natural resources by commercial mining and lumber operations. The rails and ties of the Yosemite Valley Railroad were pulled up and sold with the rest of the equipment in 1946. Additionally, flooding in 1955 and 1997 washed away portions of the railroad grade.

The portion of Incline Road that parallels the Merced River within the project area is considered to be a recreational trail that the public can use and access via State Route 140. Hiking and biking are popular activities on the trail with occasional equestrian riders using it as well. Incline Road falls within the 5.5-mile recreationally classified segment of the Merced River Wild and Scenic corridor. The U.S. Forest Service owns and maintains Incline Road for its use as a recreational trail.

Currently, Incline Road functions as the one-lane temporary State Route 140 detour.

Impacts on Section 4(f) Property

The build alternatives and the No-build Alternative would be located entirely within the Merced River Section 4(f) property. The following analyzes each alternative and the impacts the alternatives would have on the Merced River and Incline Road.

Alternative C (Open-cut Realignment)

Alternative C would use 2.23 acres of surface area within the 4(f) property. This alternative would have the following impacts on the Merced River:

- Impedes whitewater rafting by constructing piers within the active river channel. Placement of the piers would obstruct boaters and potentially trap river debris. Construction of the piers would also temporarily restrict access for rafters through the construction area.

- Construction of the bridges would not affect the limestone salamander habitat. The limestone salamander is only found within the Merced River Canyon and is a California fully protected species.
- Bridges would retain the overall moderately high scenic quality of surrounding area.
- Bridge traffic would not noticeably increase the levels of noise when compared to the river background noise. See Section 3.2.5 in the EIR/EIS for details on noise.
- Storm water runoff and water from bridge maintenance activities would affect water quality. See Section 3.2.2 in the EIR/EIS for details on storm water runoff.

This alternative would have the following impacts on Incline Road:

- Removes 320,000 cubic yards of rock material by cutting, drilling, and blasting the slope above Incline Road. A substantial cut in the amount of 400 feet long, 60 feet wide (130 feet at its highest point and 10 feet at its lowest point) would be required.
- Reestablishes Incline Road as a recreational trail by which accessibility to picnicking and fishing along with the other activities like hiking, biking, and horseback riding would be restored.
- Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places.
- Removes two patches of copper moss.

See Figure B-1 at the end of this appendix for Section 4(f) impacts. Refer to Chapter 3 for more information on impacts.

Alternative T (Tunnel Realignment)

Alternative T would use 2.23 acres of surface area within the Merced River 4(f) property. This alternative would have the following impacts on the Merced River:

- Impedes whitewater rafting by constructing piers within the active river channel. Placement of the piers would obstruct boaters and potentially trap river debris. Construction of the piers would also temporarily restrict access for rafters through the construction area.

- Construction of the bridges would not affect the limestone salamander habitat.
- Bridges would retain the overall moderately high scenic quality of the surrounding area.
- Bridge traffic would not noticeably increase the levels of noise when compared to the river background noise. See Section 3.2.5 in the EIR/EIS for details on noise.
- Storm water runoff and water from bridge maintenance activities would affect water quality. See Section 3.2.2 in the EIR/EIS for details on storm water runoff.

This alternative would have the following impacts on Incline Road:

- Removes 70,000 cubic yards of rock material by cutting, drilling, and blasting the slope above Incline Road. The tunnel would be 15 to 20 feet high, 700 feet long, and 48 feet wide, which includes the roadway and retaining walls.
- Reestablishes Incline Road as a recreational trail by which accessibility to picnicking and fishing along with the other activities like hiking, biking, and horseback riding would be restored.
- Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places.
- Removes two patches of copper moss.

See Figure B-1 at the end of this appendix for Section 4(f) impacts. Refer to Chapter 3 for more information on impacts.

Alternative S (Viaduct Realignment)

Alternative S would use 2.29 acres of surface area within the Merced River 4(f) property. This alternative would have the following impacts on the Merced River:

- Impedes whitewater rafting by constructing piers within the active river channel. Placement of the piers would obstruct boaters and potentially trap river debris. Construction of the piers would also temporarily restrict access for rafters through the construction area.
- Construction of the bridges would not affect the limestone salamander habitat.
- Bridges would reduce the overall scenic quality of surrounding area to moderate.

- Bridge traffic would not noticeably increase the levels of noise when compared to the river background noise. See Section 3.2.5 in the EIR/EIS for details on noise.
- Storm water runoff and water from bridge maintenance activities would affect water quality. See Section 3.2.2 in the EIR/EIS for details on storm water runoff.

This alternative would have the following impacts on Incline Road:

- Removes 8,300 cubic yards of rock material by cutting, drilling, and blasting the slope above Incline Road. Would also require a 358 feet long, 25 feet high cut into the northern canyon wall for placement of the viaduct section.
- Reestablishes Incline Road as a recreational trail by which accessibility to picnicking and fishing along with the other activities like hiking, biking, and horseback riding would be restored.
- Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places.
- Removes one patch of copper moss.

See Figure B-2 at the end of this appendix for Section 4(f) impacts. Refer to Chapter 3 for more information on impacts.

Alternative S-2 (Modified Viaduct Realignment)

Variation S2-V1 would use 2.25 acres of surface area within the Merced River 4(f) property. This variation would have the following impacts on the Merced River:

- Avoids impeding whitewater rafting by constructing piers above the active river channel. Construction of the piers would restrict access for rafters through the construction area.
- Construction of the bridges would not affect the limestone salamander habitat.
- Bridges would retain the overall moderately high scenic quality of surrounding area.
- Bridge traffic would not noticeably increase the levels of noise when compared to the river background noise. See Section 3.2.5 in the EIR/EIS for details on noise.

- Storm water runoff and water from bridge maintenance activities would affect water quality. See Section 3.2.2 in the EIR/EIS for details on storm water runoff.

This variation would have the following impacts on Incline Road:

- Removes 21,000 cubic yards of rock material by cutting, drilling, and blasting the slope above Incline Road. Would also require a 510-foot-long and 25-foot-high cut into the northern canyon wall for placement of the viaduct section.
- Reestablishes Incline Road as a recreational trail by which accessibility to picnicking and fishing along with the other activities like hiking, biking, and horseback riding would be restored.
- Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places. The tied-arch bridges would further resemble historical bridges often used in canyon settings; however, their heights would range between 110 feet to 130 feet high.
- Avoids sensitive plant species.

See Figure B-3 at the end of this appendix for Section 4(f) impacts. Refer to Chapter 3 for more information on impacts.

Variation S2-V2 would use 1.92 acres of surface area within the Merced River 4(f) property. This variation would have the following impacts on the Merced River:

- Avoids impeding whitewater rafting by constructing piers above the active river channel. Construction of the piers would restrict access for rafters through the construction area.
- Construction of the bridges would not affect the limestone salamander habitat.
- Bridges would improve the overall scenic quality of surrounding area to high.
- Bridge traffic would not noticeably increase the levels of noise when compared to the river background noise. See Section 3.2.5 in the EIR/EIS for details on noise.
- Storm water runoff and water from bridge maintenance activities would affect water quality. See Section 3.2.2 in the EIR/EIS for details on storm water runoff.

This variation would have the following impacts on Incline Road:

- Removes 126 cubic yards of rock material by cutting, drilling, and blasting the slope above Incline Road. Would also require a 65-foot-long and 25-foot-high cut into the northern canyon wall for placement of the viaduct section.
- Reestablishes Incline Road as a recreational trail by which accessibility to picnicking and fishing along with the other activities like hiking, biking, and horseback riding would be restored.
- Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places.
- Avoids sensitive plant species.

See Figure B-4 at the end of this appendix for Section 4(f) impacts. Refer to Chapter 3 for more information on impacts.

Alternative T-3 (Tunnel Under Slide Realignment)

Alternative T-3 would use 2.92 acres of surface area within the Merced River 4(f) property. This alternative would have the following impacts on the Merced River:

- Avoids impeding whitewater rafting by constructing on the existing State Route 140 alignment.
- Removes 0.45 acre of limestone salamander habitat, which could potentially result in an unauthorized take of the salamander.
- Tunnel would improve the overall scenic quality of surrounding area to high.
- Removes 292,000 cubic yards of rock material by cutting, drilling, and blasting the area under the rockslide. The tunnel would be 15 to 20 feet high, 2,200 feet long, and 48 feet wide, which includes the roadway and retaining walls.
- Storm water runoff and water from tunnel maintenance activities would affect water quality. See Section 3.2.2 in the EIR/EIS for details on storm water runoff.
- Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places.

- Removes between 0.25 and 0.45 acre of sensitive plant habitat and one patch of copper moss.

This alternative would have the following impact on Incline Road:

- Reestablishes Incline Road as a recreational trail by which accessibility to picnicking and fishing along with the other activities like hiking, biking, and horseback riding would be restored.

See Figure B-5 at the end of this appendix for Section 4(f) impacts. Refer to Chapter 3 for more information on impacts.

Alternative R (Rockshed/Tunnel)

Alternative R would use 1.13 acres of surface area within the Merced River 4(f) property. This alternative would have the following impacts on the Merced River:

- Avoids impeding whitewater rafting by constructing on the existing State Route 140 alignment.
- Removes 2.10 acres of limestone salamander habitat, which could potentially result in an unauthorized take of the salamander. The limestone salamander makes up the outstandingly remarkable value of wildlife, which contributes to the Merced River's designation as a Wild and Scenic River and its recreational classification.
- Tunnel would reduce overall scenic quality of surrounding area to a level of moderately low.
- Removes 80,000 cubic yards of rockslide talus by cutting and excavating. The tunnel would be 15 to 20 feet high, 48 feet wide, and extend 150 feet beyond the flanks of the rockslide, which includes the roadway and retaining walls.
- Storm water runoff and water from tunnel maintenance activities would affect water quality. See Section 3.2.2 in the EIR/EIS for details on storm water runoff.
- Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places.
- Removes between 1.05 and 2.10 acres of sensitive plant habitat.

This alternative would have the following impact on Incline Road:

- Reestablishes Incline Road as a recreational trail by which accessibility to picnicking and fishing along with the other activities like hiking, biking, and horseback riding would be restored.

See Figure B-6 at the end of this appendix for Section 4(f) impacts. Refer to Chapter 3 for more information on impacts.

No-build Alternative

The No-build Alternative would use 1.01 acres of surface area within the Merced River 4(f) property. This alternative would have the following impacts on the Merced River:

- Temporary bridges would impede whitewater rafting when the Q2 river flow is exceeded. The removal of the temporary bridges would restrict access for rafters through the construction area.
- Would not affect limestone salamander habitat.
- Metal bridges would retain a short-term visual quality of moderately high and, upon removal of the temporary structures, the landscape would be restored to its naturally high scenic quality.
- Storm water runoff and water from bridge maintenance activities would temporarily affect water quality. See Section 3.2.2 in the EIR/EIS for details on storm water runoff.
- The unavoidable failure of the bridges would close the highway at the rockslide and eliminate access to recreational activities within the project area.
- Would not affect sensitive plant species.

This alternative would have the following impacts on Incline Road:

- Temporarily eliminates Incline Road as a recreational trail until the bridges fail and the pavement removed. Activities such as hiking, biking, and horseback riding as well as access to fishing and picnicking would be temporarily eliminated since Incline Road functions as the temporary detour.

- Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources. Would not affect any property eligible for the National Register of Historic Places.

See Figure B-7 at the end of this appendix for Section 4(f) impacts. Refer to Chapter 3 for more information on impacts.

Avoidance Alternative

The build alternatives as well as the No-build Alternative would not avoid impacting the Outstandingly Remarkable Values associated with the Merced River as a Wild and Scenic River and Incline Road nor would any of these alternatives not use a portion of the 4(f) property that encompasses these resources.

A Merced River Canyon Realignment alternative was evaluated as an avoidance alternative that would avoid the Merced River and Incline Road. This avoidance alternative would require that a substantial realignment of State Route 140 outside of the Merced River Canyon be constructed in order to completely avoid impacting the Section 4(f) resources. The Section 4(f) resources boundary was equated to and determined by the Wild and Scenic Rivers recreationally classified segment, which extends ¼ mile from both sides of the Merced River and 5 and ½ mile along the river corridor. For more information on this determination, refer to the Coordination section found later in the Section 4(f) evaluation.

An avoidance alternative must be prudent and feasible to be considered for implementation.

The Code of Federal Regulations sets forth 6 factors to consider when determining whether an avoidance alternative is prudent. These factors are summarized below:

- Compromises the project so that it is unreasonable given the purpose and need
- Results in unacceptable safety or operational problems
- After reasonable mitigation, still causes severe social, economic, and environmental impacts
- Results in additional construction, maintenance, or operational costs of extraordinary measures
- Causes other unique problems or unusual factors

- Involves multiple factors that would cumulatively cause unique problems or impacts of extraordinary magnitude

The Merced River Canyon Realignment alternative would not have unacceptable safety or operational problems, cause other unique problems or unusual factors, and would not involve multiple factors that would cumulatively cause unique problems or impacts of extraordinary magnitude. However, this alternative would not be considered prudent because of the reasoning discussed in the factors below.

Compromises Project Purpose and Need

The Merced River Canyon Realignment alternative would provide full and safe access to the surrounding forest and Yosemite National Park, however this realignment of the highway around the Section 4(f) properties would also divert recreational users and tourists away from the Merced River in the project area, compromising the project so that it is unreasonable given the purpose and need. The purpose and need of the project is to restore full highway access along State Route 140 in Mariposa County at the section damaged by the Ferguson rockslide. Restoration of State Route 140 would eliminate the detour and provide full access (with the same restrictions on vehicle length that were in place before the slide) to all traffic using State Route 140 between the town of Mariposa and Yosemite National Park. The proposed build alternatives would reopen and provide full access to vehicles at the section of State Route 140 damaged by the Ferguson rockslide. The No-build Alternative temporarily provides access through the project area with a one-lane detour. However, the temporary detour would eventually be removed from either general wear of the bridge structures or from damage due to a flood event.

Results in Additional Construction, Maintenance, and Cost

A realignment of the highway around the Section 4(f) resources would require impacting undisturbed Sierra National Forest land in excess of 5 miles. The proposed build alternatives as well as the No-build Alternative are approximately 0.7 mile in length. Realigning through miles of forest would elevate both construction and maintenance costs to range between \$500 million and \$750 million. (Current proposed alternative costs range between \$33 million to \$179 million). A cost for the No-build Alternative would be in the form of removing the temporary bridges and the Incline Road pavement. Such a cost cannot be currently estimated, however removing two bridge structures and 0.7 mile of pavement would be considered less costly than constructing a highway in excess of 5 miles.

The time necessary to construct the proposed build alternatives would range between 3 to 5 years. For the No-build Alternative, the removal of the bridge structures and the pavement would require minimal time as compared to the time needed to construct a highway that realigns in excess of 5 miles around the 4(f) properties. The realignment would be severely greater than 5 years due to the time it takes to perform activities such as blasting, drilling, and cutting through the canyon and mountainous terrain.

Causes Severe Social, Economic, and Environmental Impacts

Businesses that cater to tourism and provide for whitewater rafting activities would be severely affected by realigning outside of the canyon. This realignment would compromise the use of the project area as a recreational resource. The build alternatives would not affect the businesses because access to the recreational resources would be maintained. The No-build Alternative would temporarily maintain access until its eventual removal from either failure of the structures or damage from a flood event.

A realignment of this magnitude could affect several acres of federally protected natural resources in the area of the Merced River Canyon as well as disturb miles of forest landscape. The realignment would cut a massive path through undisturbed forested land affecting the scenic qualities of the national forest. The proposed build alternatives would disturb less than 4 acres of natural communities and sensitive animal species habitat and between 0.25 and 2.1 acres of sensitive plant species habitat. The build alternatives would only add structures to a 0.7-mile stretch of highway, which moderately reduces the scenic quality of the area.

Geological disturbances would be in the form of removing rock material throughout an approximate 5-mile corridor, resulting in the disposal of massive quantities of rock and the alteration of landforms within the Sierra National Forest. The build alternatives would remove between 126 and 320,000 cubic yards of rock material within a 0.7-mile project area. The No-build Alternative would be permanently removed from the environment, and the 4(f) resources would be restored to their natural condition. However, access to the 4(f) resources would be restricted in the project area.

An avoidance alternative is feasible if it can be built as a matter of sound engineering judgment. Because the Merced River Canyon Realignment alternative could be engineered and constructed, this alternative would be considered feasible.

Given the discussion above and even after reasonable mitigation, the Merced River Canyon Realignment alternative would not be prudent. It would still cause effects to the natural environment that would be of extraordinary magnitude and compromise the purpose and need of the project by eliminating access to a recreational resource and elevating construction costs and times to a level far greater than would the currently proposed project.

Measures to Minimize Harm to the Section 4(f) Property

Measures to minimize harm to the Merced River include:

- During the rafting season, any construction being conducted on a Monday through Thursday would need to be coordinated with the U.S. Forest Service, Bureau of Land Management, and the commercial outfitters. Spotters would be placed at the rafting put-in locations and upstream from the construction area to identify time periods during which construction would need to be suspended to allow boating to continue through the project area.
- During the rafting season, any construction being conducted Friday through Sunday would need to occur between the hours of 8:00 p.m. and 8:00 a.m. Construction would be suspended during daylight hours except for construction activities, which would not impact traffic or involve work in, alongside, or above the river that can impede boating opportunities.
- During the rafting season, construction activities would need to be suspended for a four-day duration surrounding both the Memorial Day and July 4th holidays.
- A minimum of a two-week notice would need to be provided to the U.S. Forest Service, Bureau of Land Management, and the commercial outfitters prior to Caltrans closing the river for any construction activities. Any closure of the river would occur on a Wednesday. An additional 48-hour notification would need to occur to provide specific times that the river would be closed on Tuesday afternoon and when it would be opening to rafting Thursday morning.
- Any road closures would need to be planned in coordination with the U.S. Forest Service, Bureau of Land Management, and the commercial outfitters. Notification of the closures would occur a minimum of two weeks prior to the closure. An additional 48-hour notice would need to be provided for specific times of anticipated delays.
- Include Caltrans context-sensitive solutions during project development to incorporate naturally existing features into the design.

- Excavate areas using measures that preserve roots of adjacent trees.
- Retain existing rock outcroppings.
- Create a natural appearance to any rock outcropping exposed by construction, and stain to give a weathered look.
- Apply erosion control to all disturbed slopes except rock outcroppings, and prevent runoff into the river.
- Replace plant materials in specific areas to visually mitigate for structure heights and cut slopes. Consult with the U.S. Forest Service on a planting ratio.
- Replant using native species and create natural-appearing patterns.
- Place bridge piers as far as structurally possible from the Q2 boundaries of the river channel.
- Keep the bridge decks as visually thin as possible.
- Minimize the heights and massiveness of the bridge abutments so the structures appear to flow out of the landscape.
- Use colors on structures that blend into the surroundings.
- Use an open railing on the structures to increase the view of the scenery, and reduce the thickness of the bridge.
- Cut slopes at a 4:1 ratio, and construct areas to catch falling rock debris.

Measures to minimize harm to Incline Road include:

- Allow for at least 10 feet of clearance between Incline Road and the bridge deck.
- Restore Incline Road to its natural condition by removing all pavement and temporary bridge abutments.
- Trail use opportunities would need to be restored at the earliest possible date.

Refer to Chapter 3 for more information on measures to minimize harm to the Merced River and Incline Road.

Coordination

On August 29, 2007 Caltrans and the U.S. Forest Service, the agency with jurisdiction over the Merced River, initially discussed the Merced River and whether it has been classified as recreational in terms of being a Section 4(f) resource or just for the purposes of a Wild and Scenic River. Caltrans and the U.S. Forest Service continued discussing the Merced River as being protected by the Wild and Scenic Rivers Act and as a 4(f) resource due to its recreational classification. These discussions took place during a field visit in February 2008, throughout interagency meetings of the same year, and at a focused 4(f) meeting held on September 19, 2008.

Results from these meetings determined that the Merced River is a 4(f) resource as is Incline Road, which is used by the public as a recreational trail. The U.S. Forest Service also confirmed that all impacts on the Wild and Scenic River corridor, specifically the recreationally classified segment, along with measures to minimize impacts to the corridor would be considered the same for an analysis conducted on the 4(f) property. Since the impacts are to be considered the same, the 4(f) property boundary would also need to be the same as the Wild and Scenic River corridor.

On April 17, 2009 Caltrans met with the U.S. Forest Service to discuss the preparation of the Individual Section 4(f) and the Wild and Scenic River section of the environmental document. It was concluded that the Section 4(f) evaluation should analyze both the Merced River and Incline Road as 4(f) resources, have a 4(f) property boundary equivalent to the Wild and Scenic River recreationally classified segment boundary, and discuss impacts to the 4(f) resources similarly to the impacts affecting the Wild and Scenic River corridor.

On September 5, 2007, Caltrans sent the completed Historic Property Survey Report, which contained the finding of effect, to the State Historic Preservation Officer. On October 10, 2007, the State Historic Preservation Officer concurred with the findings presented in the Historic Property Survey Report. On June 17, 2010, Caltrans submitted the Supplemental Historic Property Survey Report, which contained the newly proposed alternatives, to the State Historic Preservation Officer. The State Historic Preservation Officer has been given the opportunity to comment on the supplemental report.

Least Harm Analysis

Both the Merced River and Incline Road are considered to be equally and significantly important recreational features to the U.S. Forest Service. The Wild and Scenic Rivers Act and Section 4(f) of the Department of Transportation Act protect

both of these resources as they contribute to the recreational value of the Merced River Canyon.

All of the proposed alternatives would affect both of the Section 4(f) resources because they fall within the Wild and Scenic River Corridor, which also defines the 4(f) property boundary. All alternatives meet the purpose and need except for the No-build Alternative; the temporary bridges would eventually fail leading to the closure of State Route 140 at the Ferguson Rockslide whereas the build alternatives would permanently restore State Route 140 providing access to these resources.

Costs for the build alternatives range from \$33 million to \$179 million. The tunnel alternatives, T, T-3, and R, would be the most expensive with Alternatives T and R costing nearly \$80 million. Alternative T-3 would cost nearly \$179 million. These alternatives cost more because they would require removing significant amounts of rock material and the construction of tunnel structures. Alternative S is the least expensive at \$33.7 million, with S2-V2 costing \$37.9 million, second to the least expensive. The costs for these alternatives are lower because they propose to remove the least amount of rock material and would construct concrete bridges. Alternative C proposes a cost of \$53 million. This is a higher cost than the other concrete bridge alternatives because cutting through the hill would require removing a large amount of rock material. Alternative S2-V1 proposes a cost similar to the tunnel alternatives at \$92.2 million. The higher cost of this alternative is due to the tied-arch structures needed to span the Merced River.

Alternatives C, T, S, and the No-build Alternative would affect the Merced River by impeding whitewater rafters as the bridge piers would be constructed within the active river channel. Alternatives S-2, T-3, and R avoid affecting whitewater rafting activities. The build alternatives would restore Incline Road to natural conditions and allow for its use as a recreational trail. All of the alternatives would affect the water quality of the river as well as reduce the scenic quality of the area. However, mitigation measures would minimize the effects to these resources.

For the No-Build Alternative, the eventual failure of the temporary bridges would cause the removal of the pavement along Incline Road and its return to its previous use as a trail. However, until that failure occurs, Incline Road would continue to be used as State Route 140 preventing any trail activities from occurring. There are no mitigation measures that would reduce the severity of this impact.

Only Alternatives R and T-3 would remove protected wildlife habitat. The build alternatives would potentially impact the habitat of the State designated fully protected ringtail, at least temporarily, due to ground disturbance related to construction. In addition, Alternatives R and T-3 would both remove potential habitat for the State designated fully protected limestone salamander. All but one of the build alternatives has some effect on sensitive plant species, including copper moss, Tompkins sedge, Mariposa clarkia, and smallflower monkeyflower. Alternative T-3 would have an impact on all four species, while Alternative S-2 would have no effect on any of them. Alternatives C, T and S would affect one or two populations of copper moss each. Alternative R would remove more than an acre of smallflower monkeyflower habitat, and slightly more than 2 acres of habitat for Mariposa clarkia and Tompkins sedge. The No-build Alternative would not affect protected wildlife or vegetation.

The designation of “fully protected” through Section 5050 of the California Fish and Game Code means a take of this species cannot be authorized through the Section 2081 permitting process and implementation of mitigation measures. Since an incidental take of this species is not permitted by the California Department of Fish and Game, there are no mitigation measures available to minimize the take of this species or its habitat.

The build alternatives would remove rock material from the 4(f) property. For all these build alternatives, there would be a significant amount of rock removed through cutting, blasting and drilling. Alternative C would result in removing 320,000 cubic yards of rock, while Alternative T-3 would remove 292,000 cubic yards, Alternative R would remove 80,000 cubic yards of the rockslide talus, and Alternative T would take about 70,000 cubic yards of material from the site. Alternatives S and S-2 would cut large sections from the northern slope for viaduct placement. Alternative S would result in removing 8,300 cubic yards of rock, while S2-V1 would remove 21,000 cubic yards, and S2-V2 would remove 126 cubic yards, the least amount of rock material removed by the build alternatives. All the build alternatives have the potential to create minor rockfalls in cut areas, and Alternatives R and T-3 also offer possible exposure to future slides. No rock material would be removed as a result of the No-build Alternative.

Mitigation measures would be incorporated into the build alternatives to reduce potential rockfalls and slope erosion; however, there would be no mitigation that would reduce the severity of rock material removed from the project area as a result of each of the build alternatives.

The build alternatives would not affect cultural resources within the project area. The portions of the Yosemite Valley Railroad (Incline Road), the Jenkins Hill Trail, and State Route 140 were determined to lack the integrity of materials, setting, feeling, or design for their respective periods of significance. Thus, the build alternatives would not alter any significant qualities of these already-compromised segments of the resources. All alternatives would avoid affecting any property eligible for or on the National Register of Historic Places. The build alternatives would also avoid the bedrock mortar site.

Currently, the No-build Alternative operates as the temporary State Route 140 over the Yosemite Valley Railroad alignment, altering a 0.5-mile segment of the resource. Eventually, the temporary bridges of the No-Build will fail, and the pavement would be removed from the railroad grade, returning the resource to the natural alignment and use as a trail. Mitigation would not be required since there would be no adverse impacts to the cultural resources from any of the proposed alternatives.

Refer to Table B.1 for a comparison of the alternatives' impacts to the 4(f) resources.

Other Park, Recreational Facilities, Wildlife Refuges, and Historic Properties Evaluated Relative to the Requirements of Section 4(f)

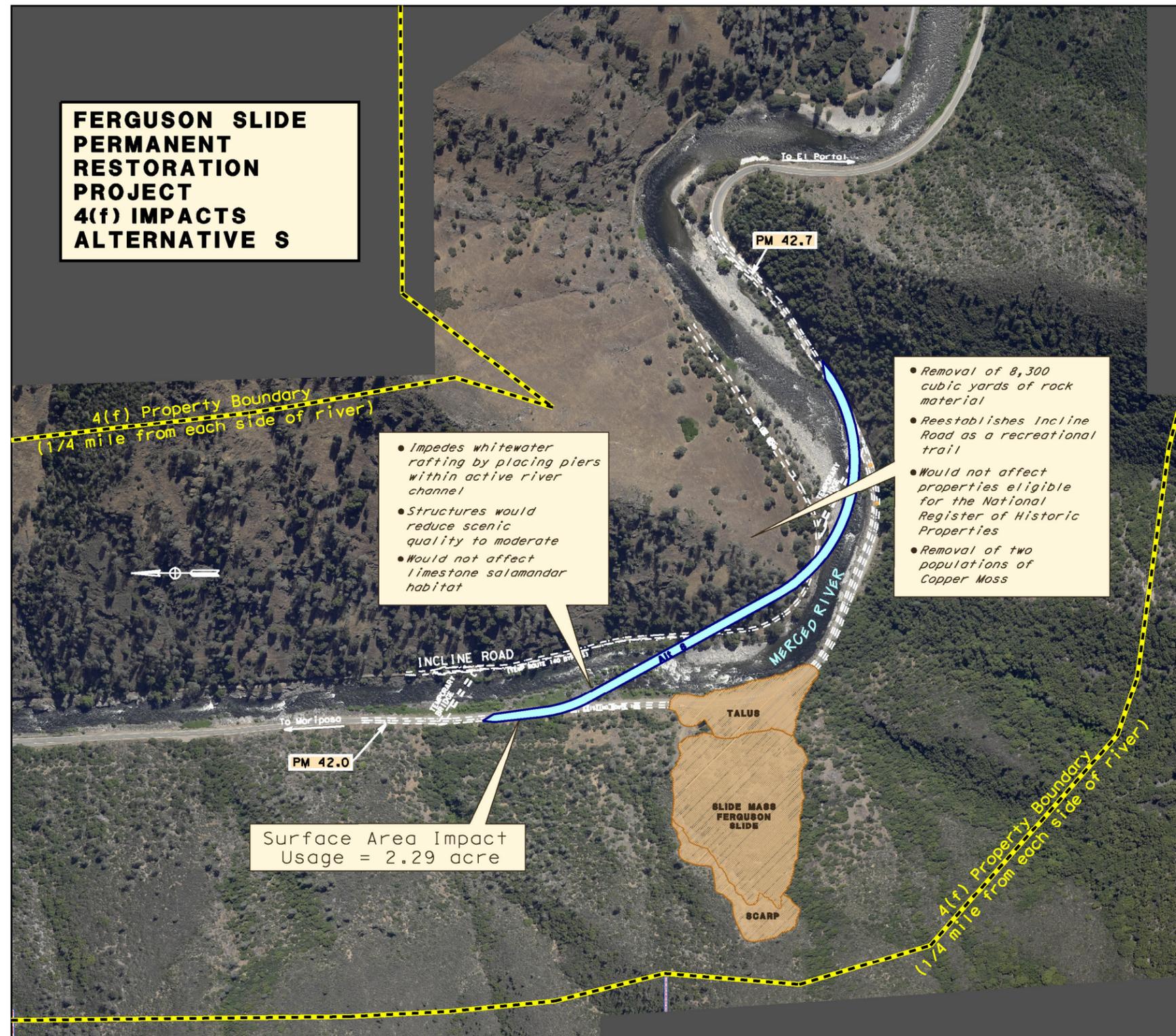
This section of the document discusses parks, recreational facilities, wildlife refuges, and historic properties found within or adjacent to the project area that do not trigger Section 4(f) protection either because: 1) they are not publicly owned, 2) they are not open to the public, 3) they are not eligible historic properties, 4) the project does not permanently use the property and does not hinder the preservation of the property, or 5) the proximity impacts do not result in constructive use.

Yosemite National Park is the main tourist attraction of Mariposa County and considered to be a well-known Section 4(f) property. People from around the world visit the park to sightsee, hike and camp. Three state highways access the park. State Route 140 is one, and State Routes 120 and 41 are the other two. While the build alternatives would not use any portion of this park, deny access to, or affect any resource within the park, the unavoidable closure of the highway as a result of the

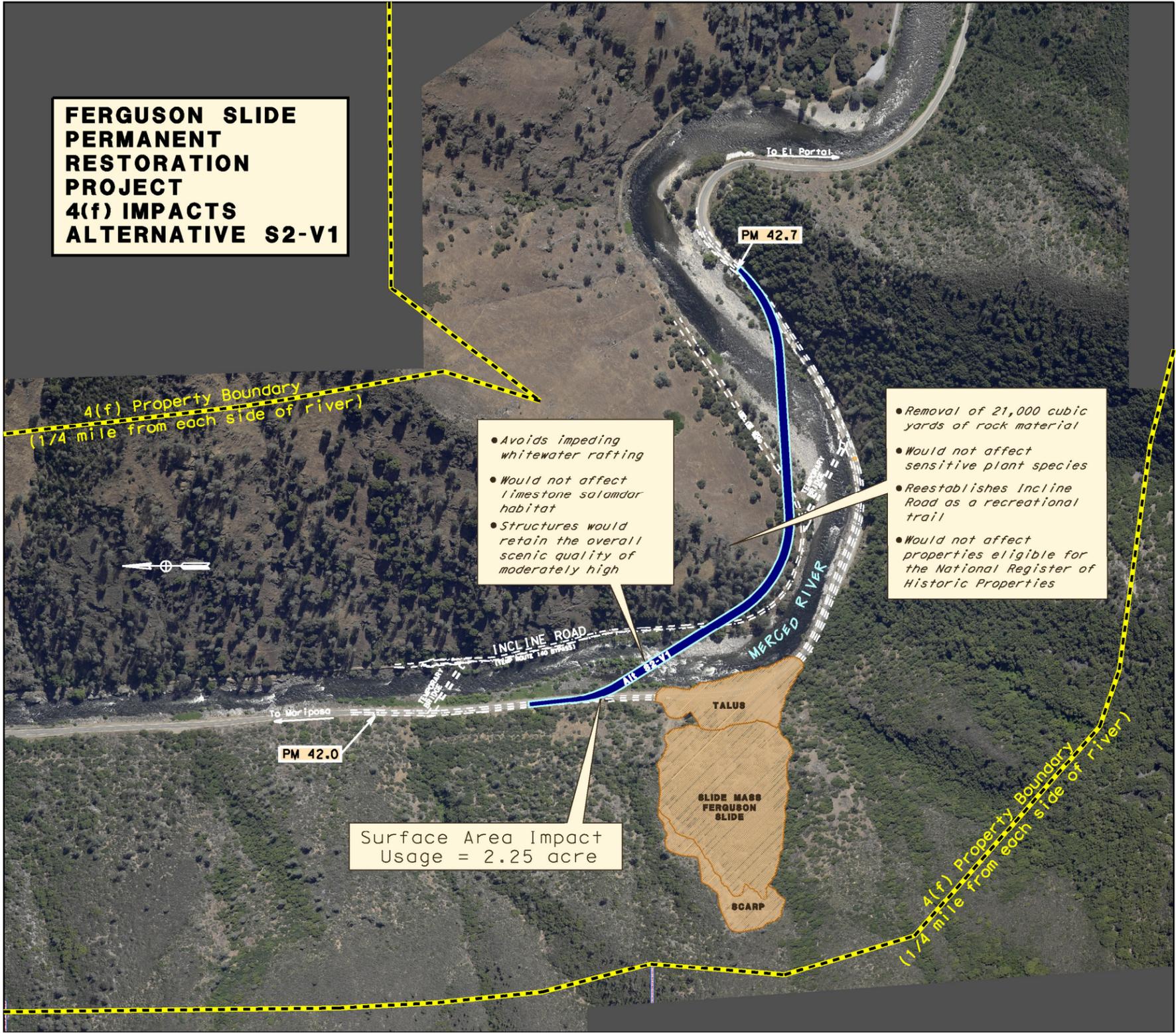
No-build Alternative would eliminate access to the park for individuals traveling from the west side of the Ferguson rockslide via State Route 140.

Table B.1 Section 4(f) Property Impacts

Impact	Alternative C	Alternative T	Alternative S	Alternative S-2	Alternative R	Alternative T-3	No-build Alternative
Reopen and Restore Full Access	Yes	Yes	Yes	Yes	Yes	Yes	No
Use of 4(f) Property	2.23 acres	2.23 acres	2.29 acres	S2-V1: 2.25 acres S2-V2: 1.92 acres	1.13 acres	2.92 acres	1.01 acres
Recreation	Bridge maintenance activities would create water quality impact Would construct bridge pier in the flow of whitewater rafting Reestablishes Inline Road as a recreational trail New structures would moderately reduce scenic quality	Bridge maintenance activities would create water quality impact Would construct bridge pier in the flow of whitewater rafting Reestablishes Incline Road as a recreational trail New structures would moderately reduce scenic quality	Bridge maintenance activities would create water quality impact Would construct bridge pier in the flow of whitewater rafting Reestablishes Incline Road as a recreational trail New structures would moderately reduce scenic quality	Bridge maintenance activities would create water quality impact Reestablishes Incline Road as a recreational trail New structures would moderately reduce scenic quality	Reestablishes Incline Road as a recreational trail New structures would reduce scenic quality to moderately low Tunnel maintenance activities would create water quality impact	Reestablishes Incline Road as a recreational trail New structures would moderately reduce scenic quality Tunnel maintenance activities would create water quality impact	Temporarily eliminates Incline Road as a recreational trail Bridge maintenance activities would create water quality impact Temporary structures decrease scenic quality
Geology	Would remove 320,000 cubic yards of rock material	Would remove 70,000 cubic yards of rock material	Would cut 358-foot-long by 30-foot-wide section of northern slope for placement of viaduct and remove 8,300 cubic yards of rock material	S2-V1: Would cut 510-foot-long by 30-foot-wide-section of northern slope for placement of tied-arch viaduct and remove 21,000 cubic yards of rock material. S2-V2: Would cut 65-foot-long by 30-foot-wide section of northern slope for placement of viaduct and remove 126 cubic yards of rock material.	Would remove the talus (80,000 cubic yards) of the rockslide	Would remove 292,000 cubic yards of rock material	None
Cultural Resources	Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places	Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places	Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places	Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places	Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places	Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places	Avoids altering any significant qualities of the already-compromised segments of the identified cultural resources and any property eligible for the National Register of Historic Places
Vegetation	Two patches of copper moss would be removed.	Two patches of copper moss would be removed	One patch of copper moss would be removed	None	2.10 acres of Mariposa clarkia and Tompkins sedge habitat would be removed 1.05 acres of smallflower monkeyflower habitat would be removed	0.45 acre of Mariposa clarkia and Tompkins sedge habitat would be removed 0.25 acres of smallflower monkeyflower habitat would be removed One patch of copper moss would be removed	None
Wildlife	Would not affect limestone salamander habitat	Would not affect limestone salamander habitat	Would not affect limestone salamander habitat	Would not affect limestone salamander habitat	Would remove 2.10 acres of limestone salamander habitat	Would remove 0.45 acre of limestone salamander habitat	None
Cost	\$53.0 million	\$79.8 million	\$33.7 million	S2-V1: \$92.2 million S2-V2: \$37.9 million	\$78.5 million	\$178.8 million	N/A



**FERGUSON SLIDE
PERMANENT
RESTORATION
PROJECT
4(f) IMPACTS
ALTERNATIVE S2-V1**



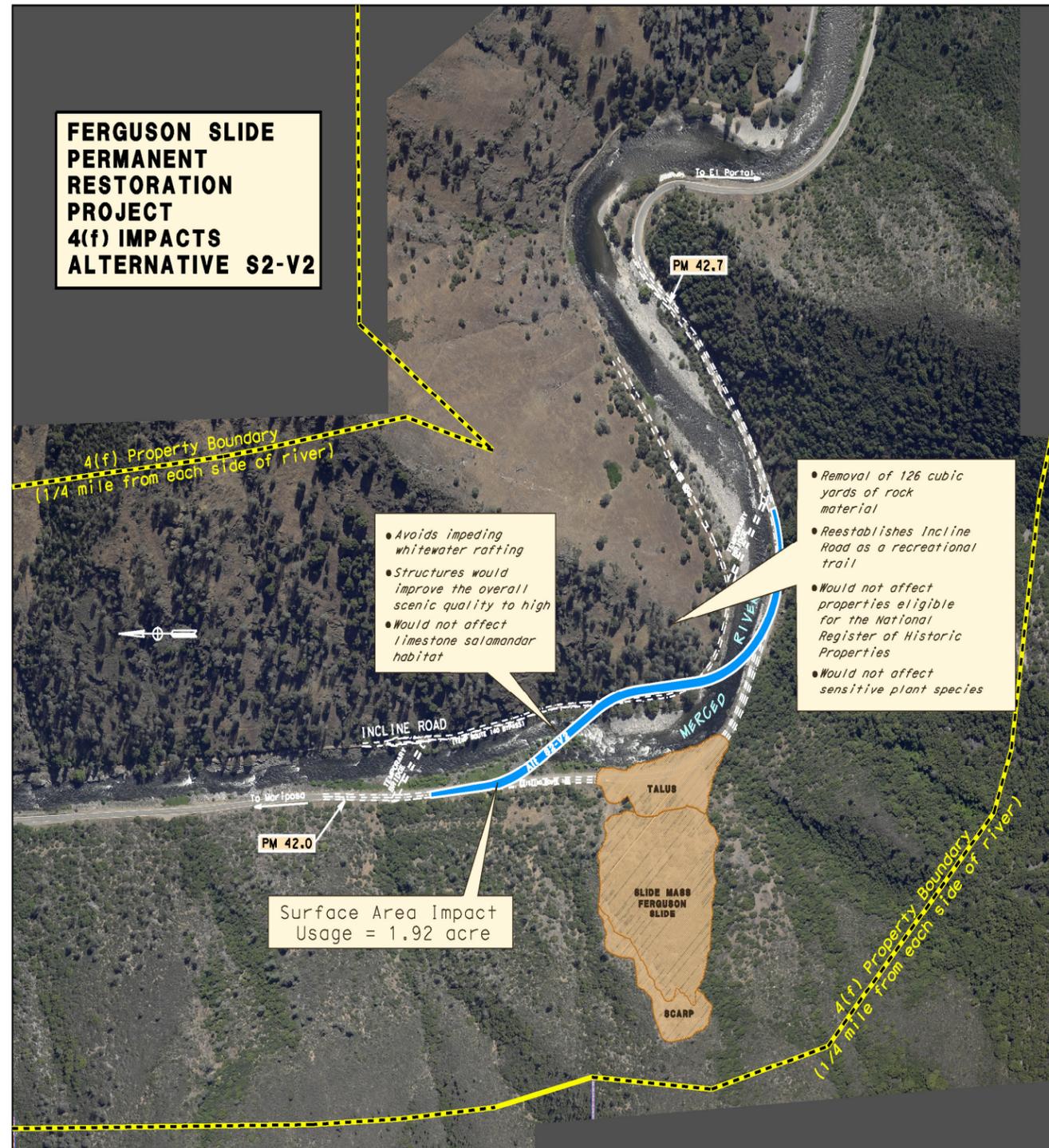
4(f) Property Boundary
(1/4 mile from each side of river)

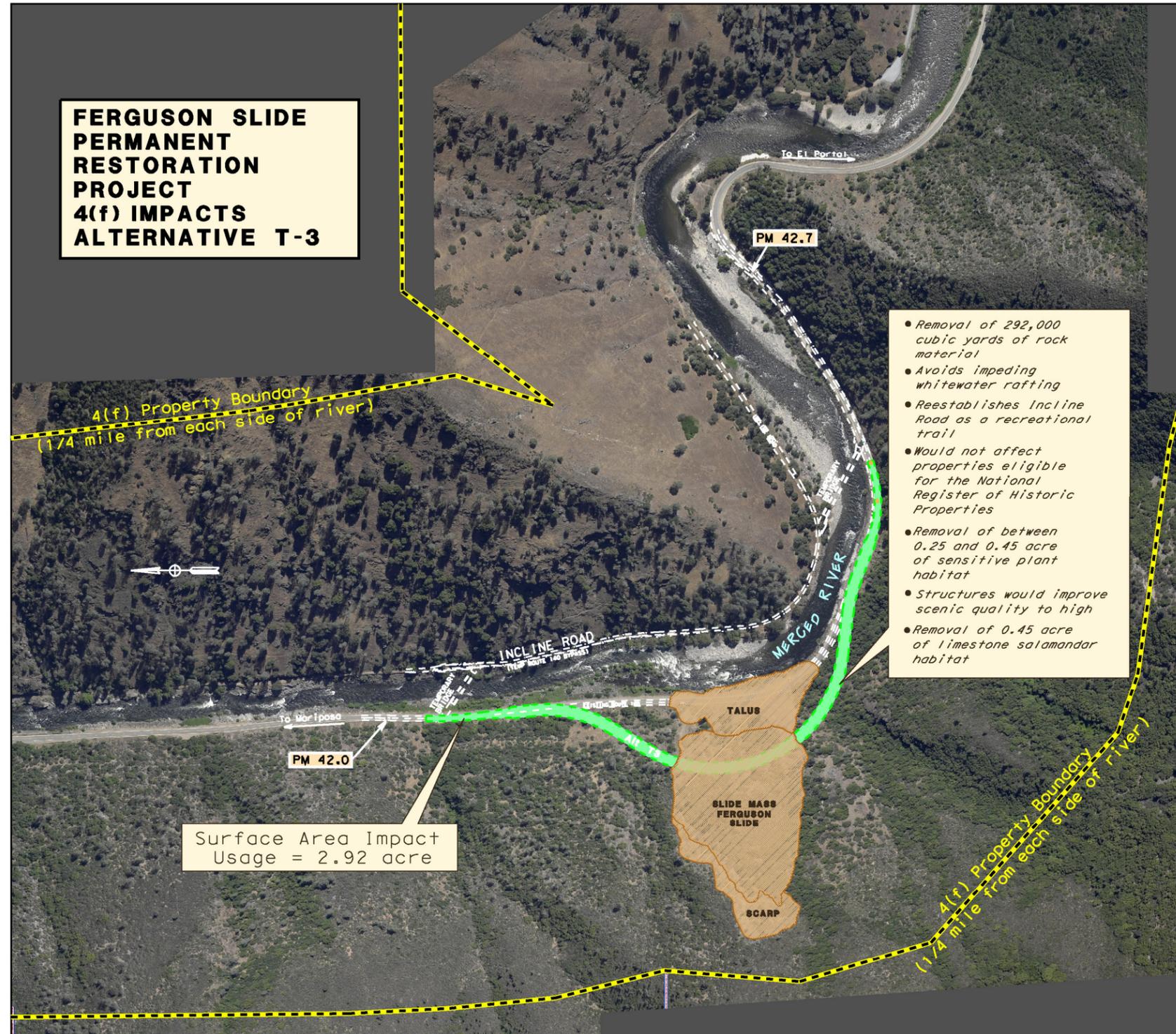
- Avoids impeding whitewater rafting
- Would not affect limestone salamdar habitat
- Structures would retain the overall scenic quality of moderately high

- Removal of 21,000 cubic yards of rock material
- Would not affect sensitive plant species
- Reestablishes Incline Road as a recreational trail
- Would not affect properties eligible for the National Register of Historic Properties

Surface Area Impact
Usage = 2.25 acre

4(f) Property Boundary
(1/4 mile from each side of river)





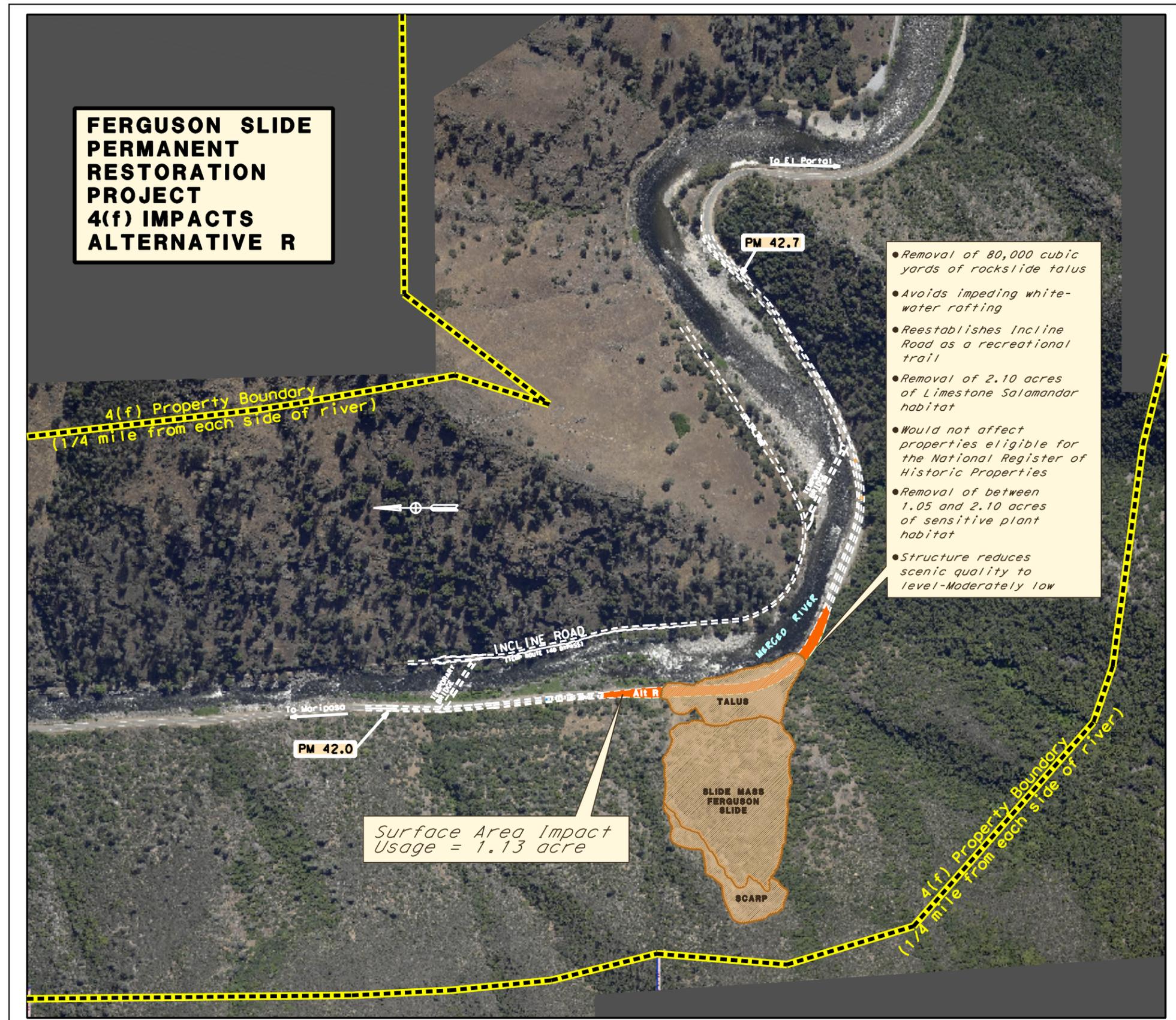
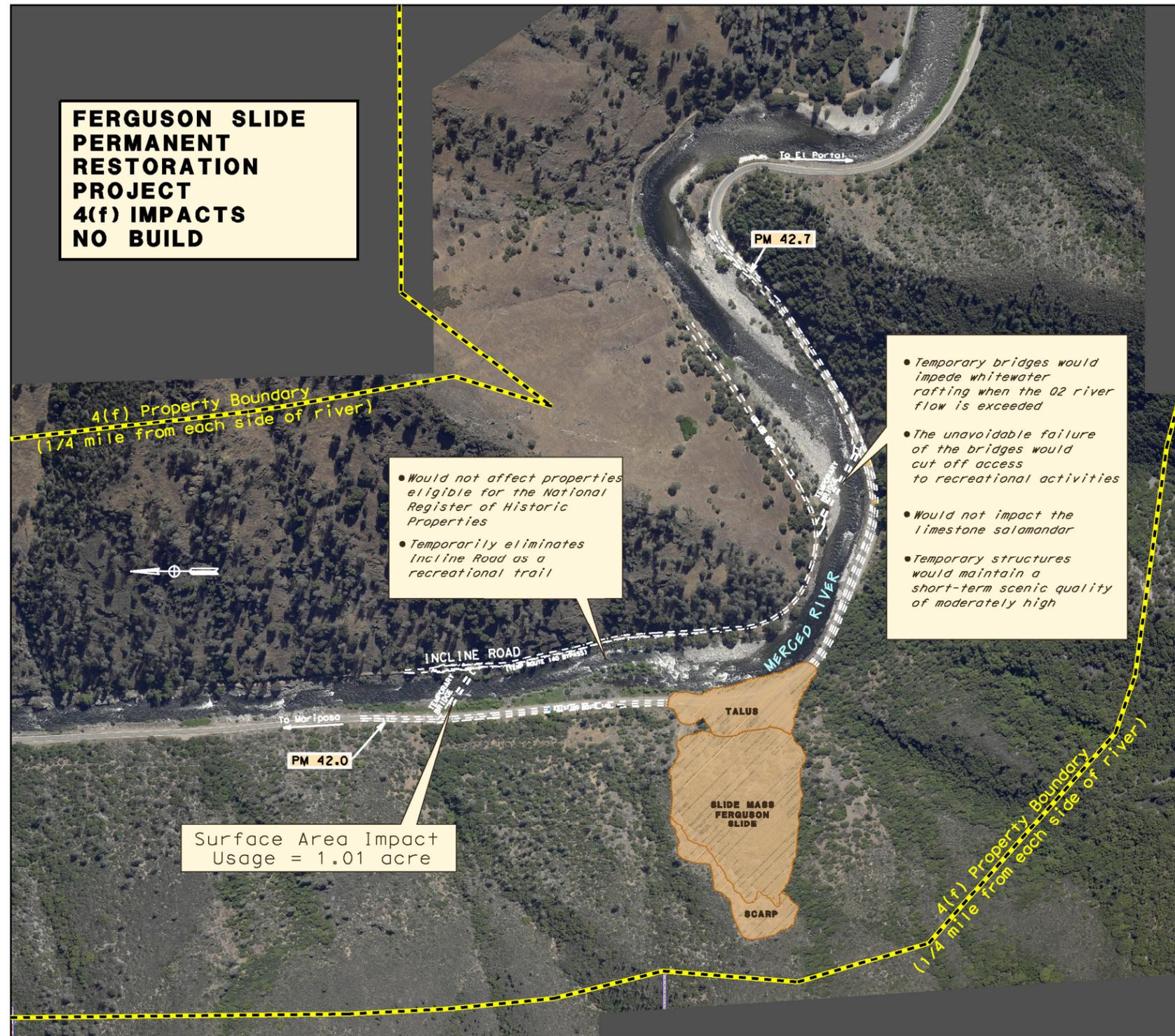


Figure B-6 Alternative R



Appendix C Title VI Policy Statement

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE DIRECTOR
1120 N STREET
P. O. BOX 942873
SACRAMENTO, CA 94273-0001
PHONE (916) 654-3266
FAX (916) 654-6608
TTY (916) 651-4086

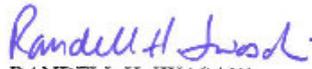


*Flex your power!
Be energy efficient!*

August 25, 2009

TITLE VI POLICY STATEMENT

The California State Department of Transportation under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.


RANDELL H. IWASAKI
Director

"Caltrans improves mobility across California"

Appendix D SHPO Concurrence Letter

STATE OF CALIFORNIA – THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.ca.gov
www.ohp.ca.gov



October 10, 2007

Reply To: FHWA070910A

Jeanne Binning, Branch Chief
Central California Cultural Resources Branch
Department of Transportation
2015 East Shields Avenue, Suite A-100
Fresno, CA 93726-5428

Re: Determinations of Eligibility for the Ferguson Slide Permanent Restoration Project,
Mariposa County, CA

Dear Ms. Binning:

Thank you for consulting with me about the subject undertaking in accordance with the 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 Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California (PA).

The California Department of Transportation is requesting my concurrence, pursuant to Stipulation VIII.C.5 of the PA, that the following properties are not eligible for the National Register of Historic Places:

- CA-MRP-001552H
- Yosemite Valley Railroad Grade
- Jenkins Hill Trail
- State Route 14

Based on my review of the submitted documentation, I concur.

Thank you for considering historic properties during project planning. If you have any questions, please contact Natalie Lindquist of my staff at (916) 654-0631 or e-mail at nlindquist@parks.ca.gov or Bill Soule at (916) 654-4614 or e-mail at wsoule@parks.ca.gov.

Sincerely,

Susan K. Shattuck for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

Appendix E Minimization and/or Mitigation Summary

The following tables summarize the mitigation and minimization measures required as a result of the proposed project's impacts to the environment.

Summary of Mitigation

Area	Impact	Mitigation
Visual Resources	Alteration of scenic landscape and an overall moderate decrease in the visual quality of the area	Replace and replant removed trees and shrubs Apply erosion control to disturbed soil and create weathered appearance on exposed rocks Apply aesthetic treatments to structures
Geological Resources	Remove between 126 and 320,000 cubic yards of rock material and rockfalls on cut slopes	Cut slopes at a 1:4 ratio or flatter Provide 22-foot-wide area adjacent to and at the same grade as the highway to prevent rocks from falling onto the highway Entrances for both Alternatives R and T-3 would be constructed at least 150 feet away from the flanks of the slide Rockfall barriers could also be used to protect the roadway from the possibility of falling rock Use blasting equipment such as hydraulic splitters and hoe rams to control the spread of rocks and limit vibrations and noise
Oak Woodlands	Affect between 0.4 and 3.3 acres of habitat	Mitigate for oaks at a 3:1 ratio based on the acreage of impact Mitigation plans would be approved by the California Department of Fish and Game and the U.S. Forest Service
Waters of the U.S.	Placement of 0.005 to 0.06 acre of fill into the banks of the Merced River	Onsite planting of native shrubs and trees and monetary compensation at a 1.5 to 1 ratio through the Army Corps of Engineers

Area	Impact	Mitigation
		National Fish and Wildlife Foundation
Plant Species	Affect between 0.25 and 2.10 acres of sensitive plant habitat	Environmentally sensitive area fencing Coordination with the U.S. Forest Service on replacement planting
Animal Species	Indirect effect to hardhead fish and removal of bat habitat	Four bat boxes would be installed in each of the bridges Replace oak woodland at a 3:1 ratio based on the acreage of impact Removal of trees only during the non-nesting season defined as February 15 through September 1. A “no in-stream work” window of April and May would be established to avoid impacts during the spawning season.

Summary of Minimization and Monitoring

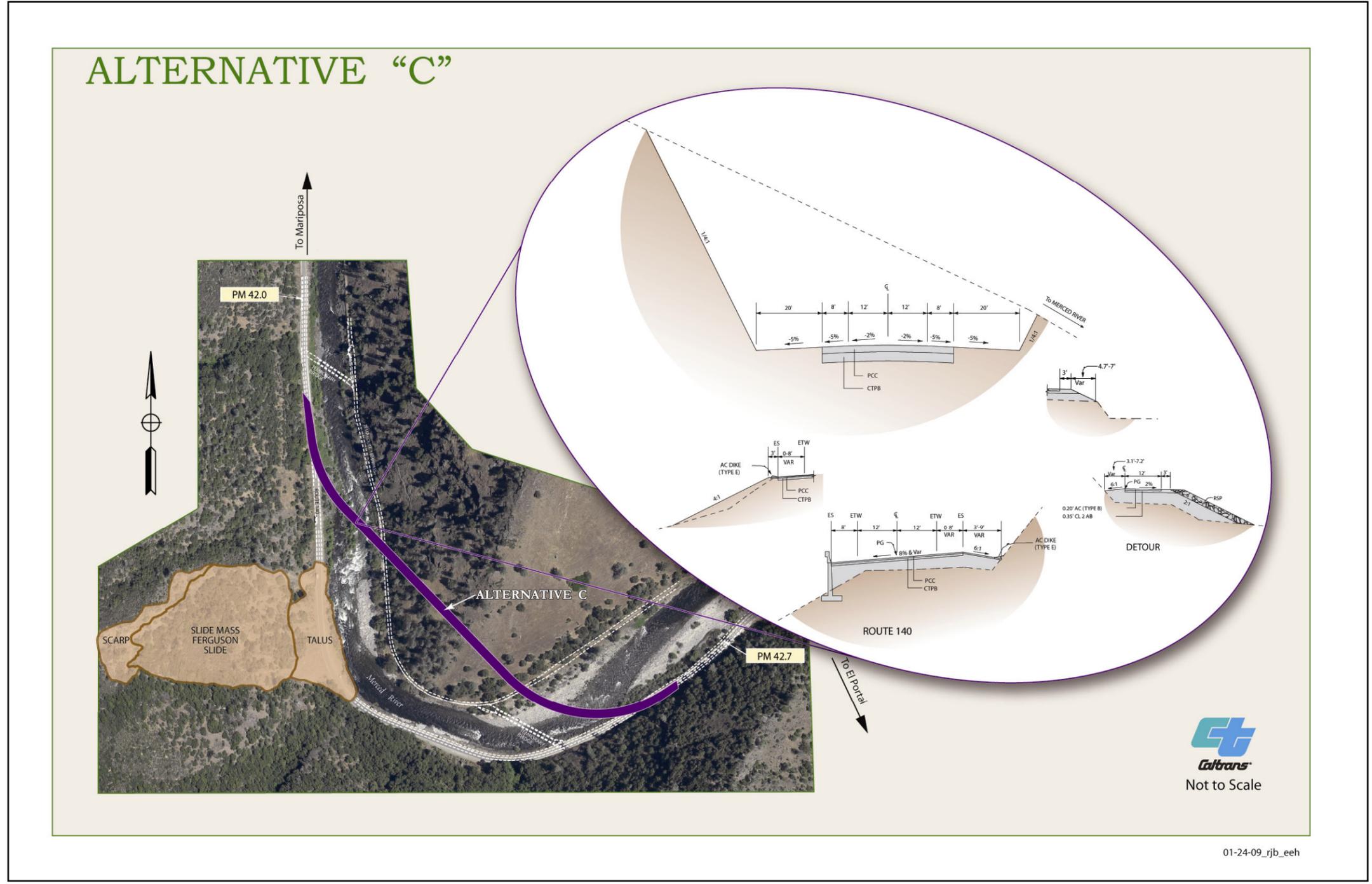
Area	Impact	Mitigation
Wild and Scenic Rivers	Temporary construction impacts on the recreational value of the Merced River	<ul style="list-style-type: none"> • During the rafting season, construction activities, road closures, and river closures would need to be coordinated in advance with the U.S. Forest Service, Bureau of Land Management, and the commercial outfitters as to not prevent boating activities • Construction activities should accommodate holidays and weekends by either suspending construction or performing work at night • Spotters should be placed at the rafting put-in locations and upstream from the construction area to identify time periods during which construction would need to be suspended <p>Trail use opportunities would need to be restored at the earliest possible date</p> <p>For other “outstandingly remarkable value” minimization measures, refer to Geological and Cultural Resources and Plant Species</p>
Traffic and Transportation/Pedestrian and Bicycle Facilities	Temporary traffic delays and roadway closures from construction activities	Limited short-term closures and night and weekend work confined to a series of two-hour work windows Construction staging
Cultural Resources	Potentially eligible bedrock mortar site	Protect site with environmentally sensitive area fencing
Water Quality and Storm water Runoff	Short-term increase in sediment and turbidity (cloudiness) in surface water Long-term effects from bridge runoff and bridge maintenance activities	Apply erosion control Implement a Storm Water Pollution Prevention Plan during construction and a Storm Water Management Plan after construction Incorporate pollution prevention measures such as constructing culverts that carry runoff to unlined channels

Area	Impact	Mitigation
Hazardous Waste or Materials	Exposure to elevated levels of arsenic	Classify and properly dispose of all hazardous waste materials at a Class 1 landfill
Noise	Temporary noise increase from construction	Use construction methods or equipment that would provide the lowest level of noise Use well-maintained equipment Use temporary noise barriers and relocate them as needed to protect recreational users against excessive construction noise Implement a construction noise-monitoring program to limit the impacts Conduct noisier operations when there are few recreational users in the area
Threatened and Endangered Species	Remove potential Merced clarkia habitat	Environmentally sensitive area fencing would be placed around the Merced clarkia habitat Consultation with the California Department of Fish and Game and a 2081 permit
Invasive Species	Distribution of invasive plant species through ground disturbance	A re-vegetation plan for erosion control would be implemented to prevent the spread of invasive plant species

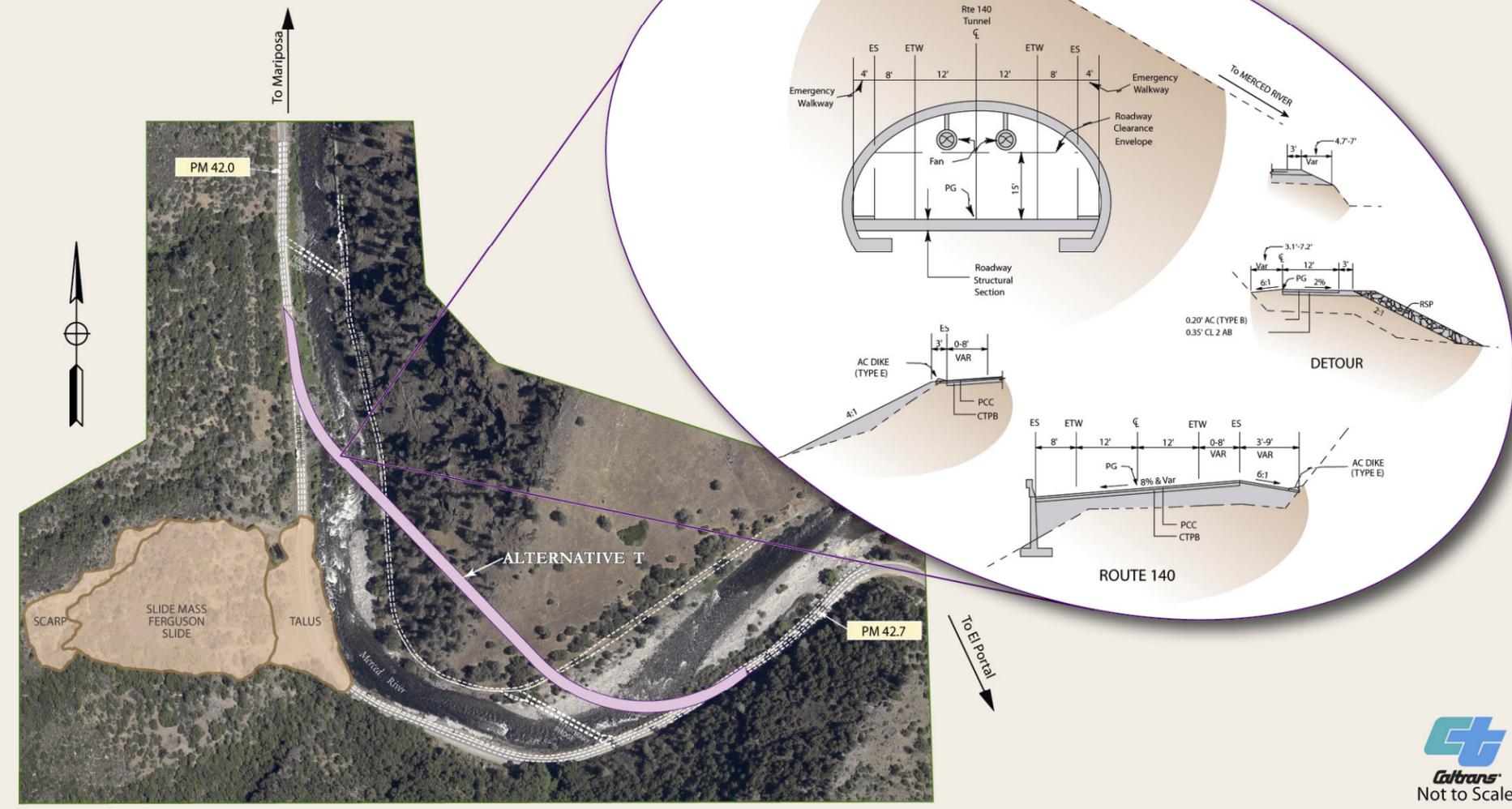
For more detailed information on mitigation, minimization, and monitoring commitments, refer to Chapter 3, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures for these impact areas.

Refer to Section 4.3 for mitigation measures required to address significant impacts under the California Environmental Quality Act.

Appendix F Typical Cross Sections

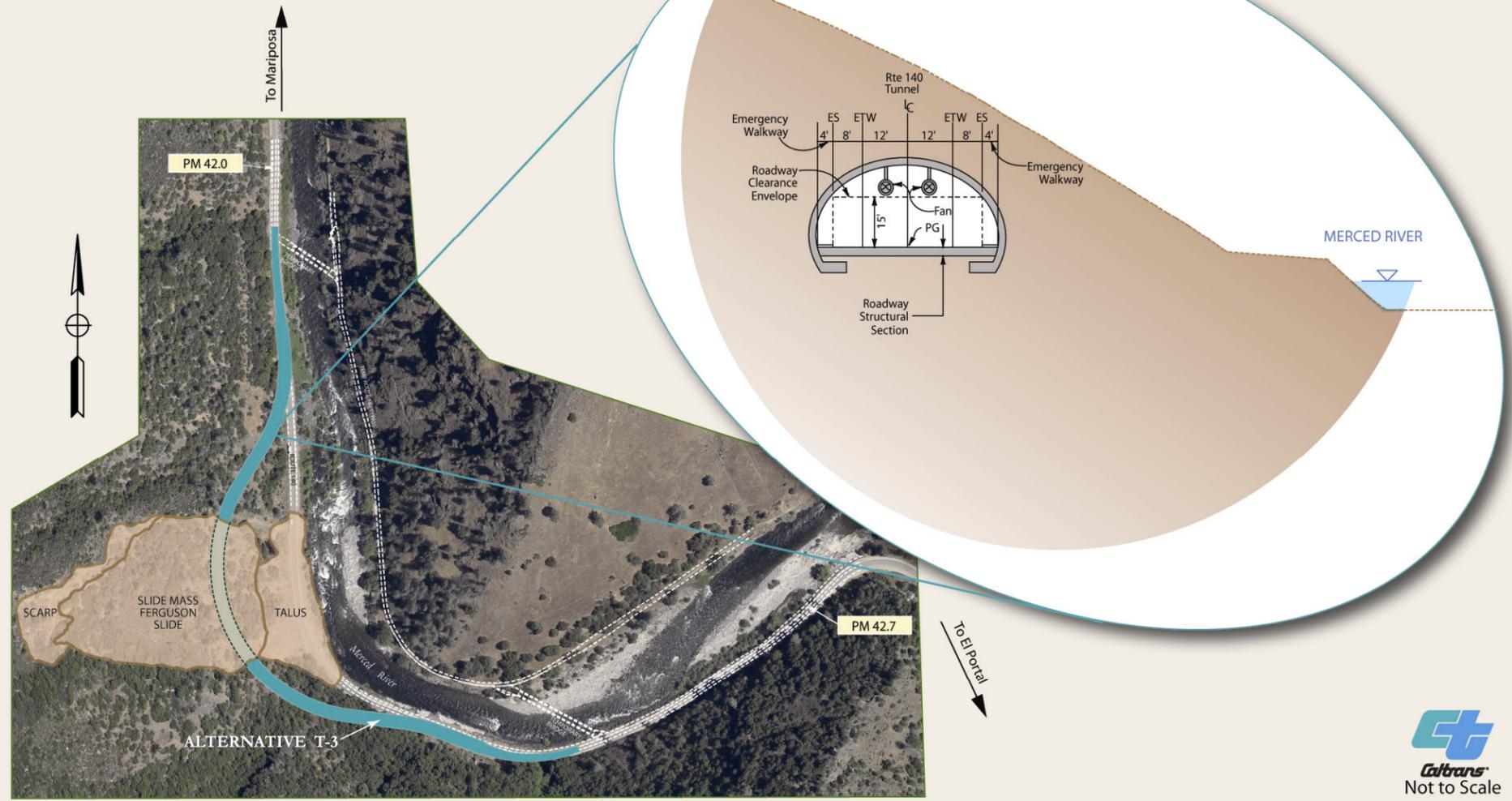


ALTERNATIVE "T"



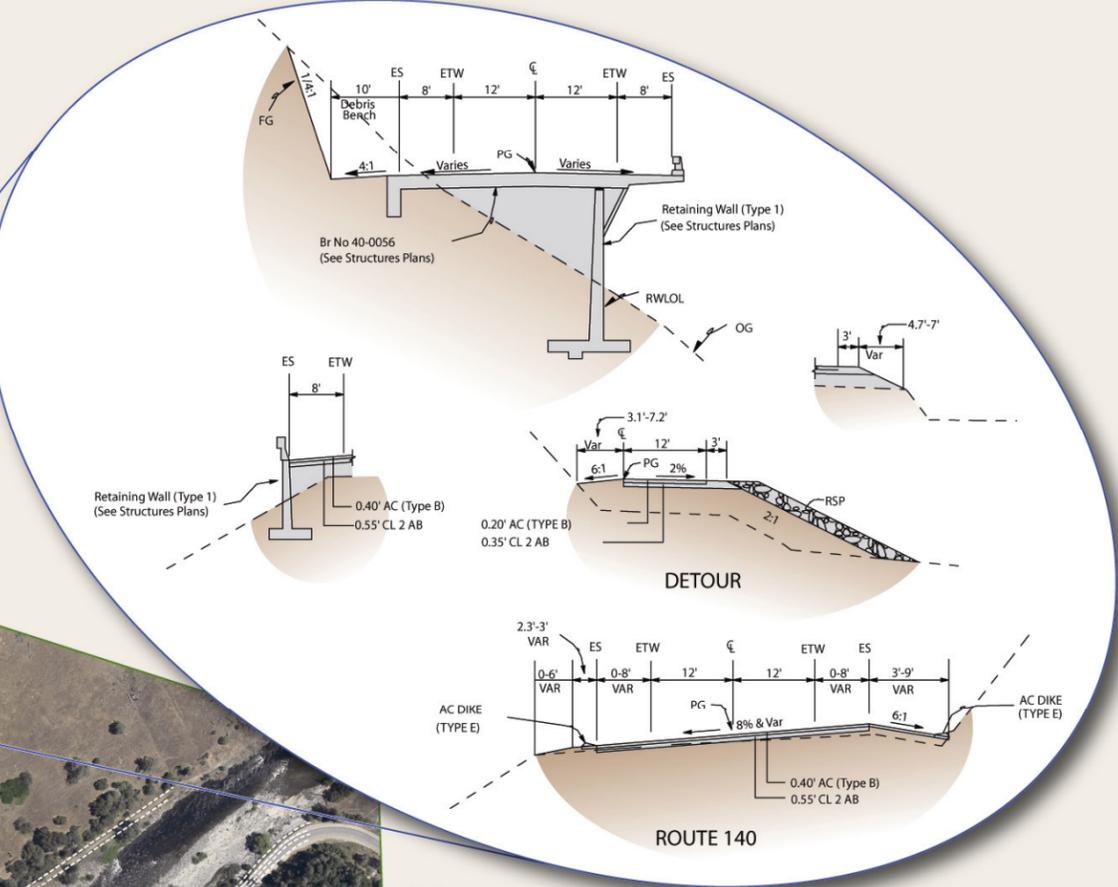
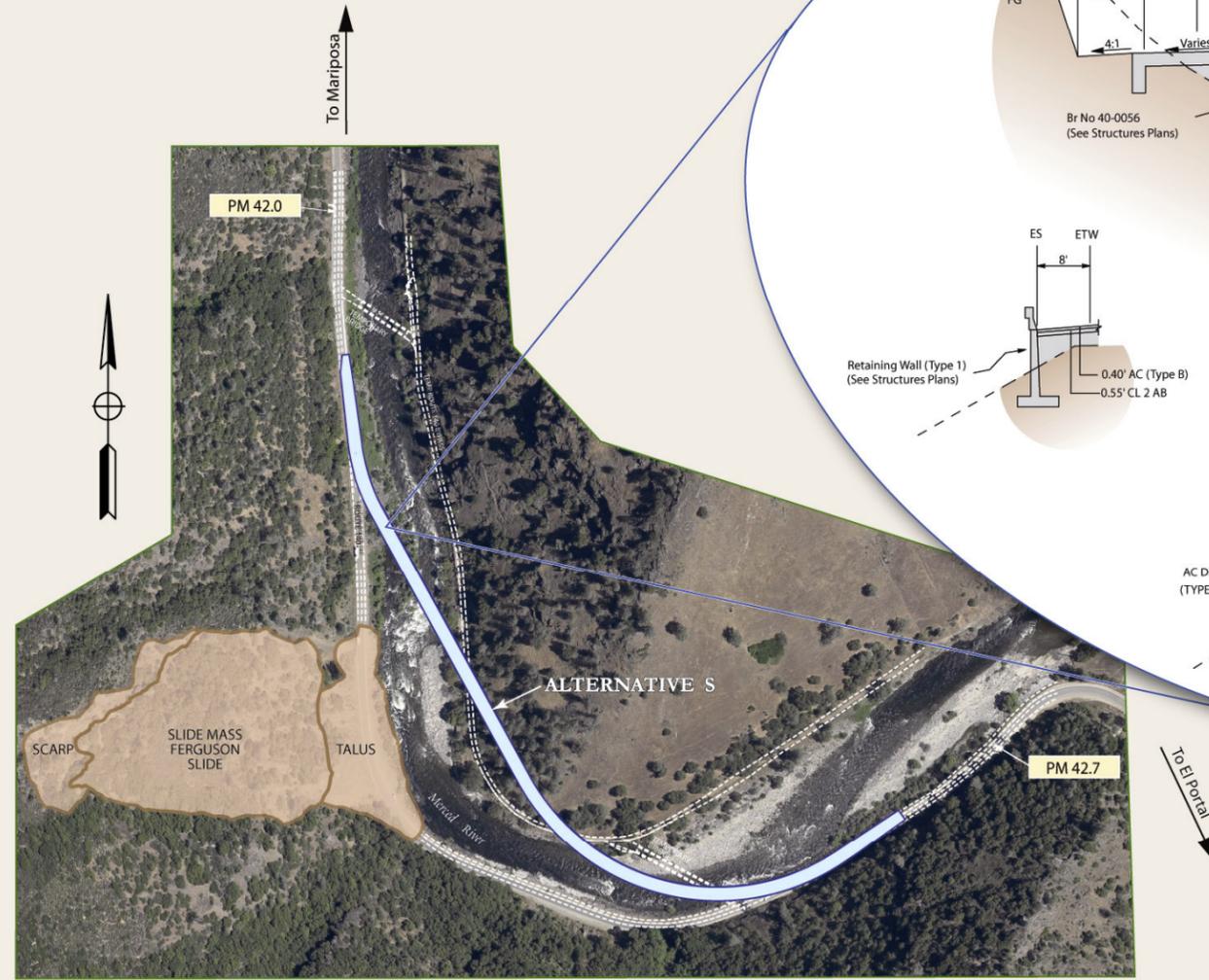
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ALTERNATIVE "T-3"



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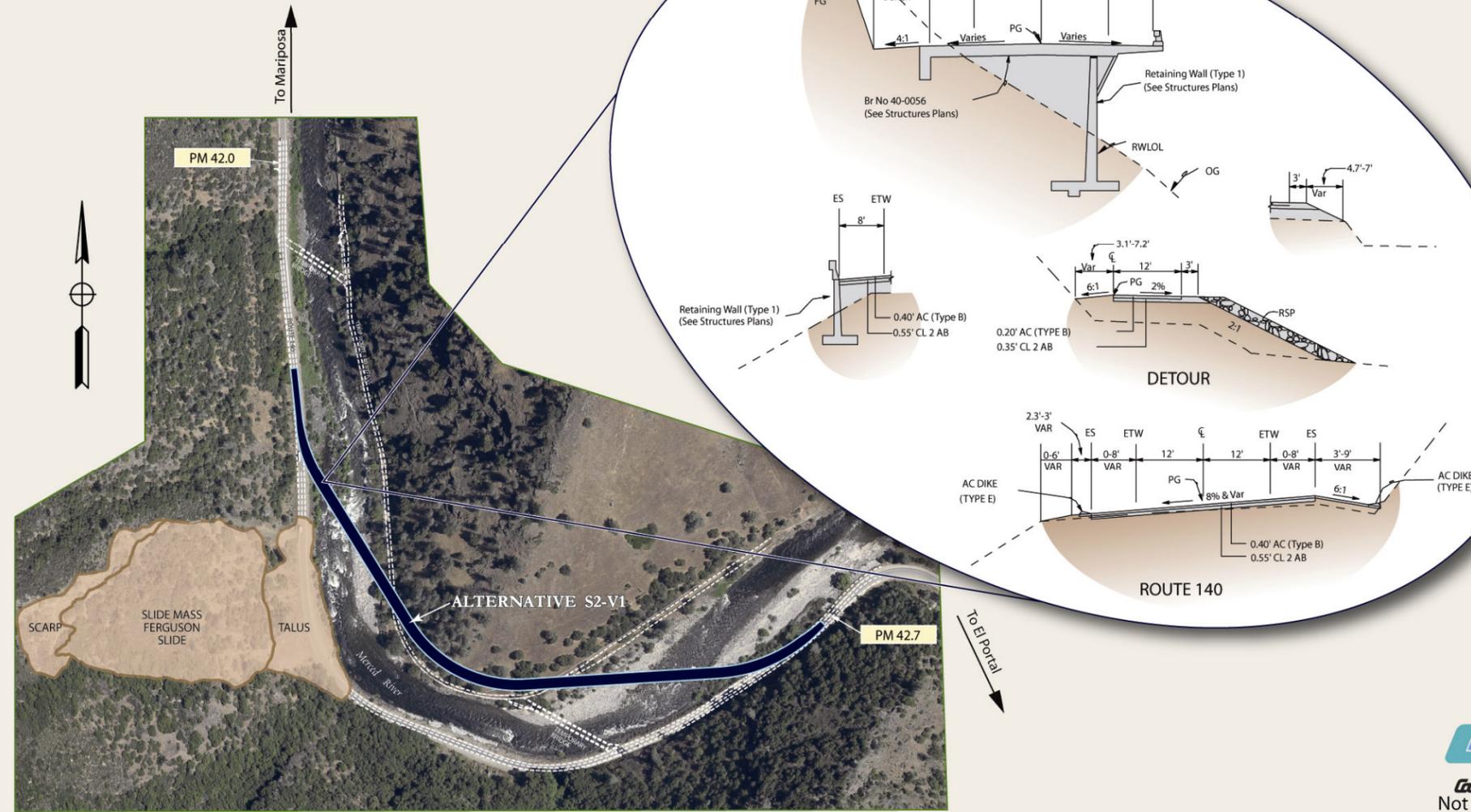
ALTERNATIVE "S"



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ALTERNATIVE "S2-V1"

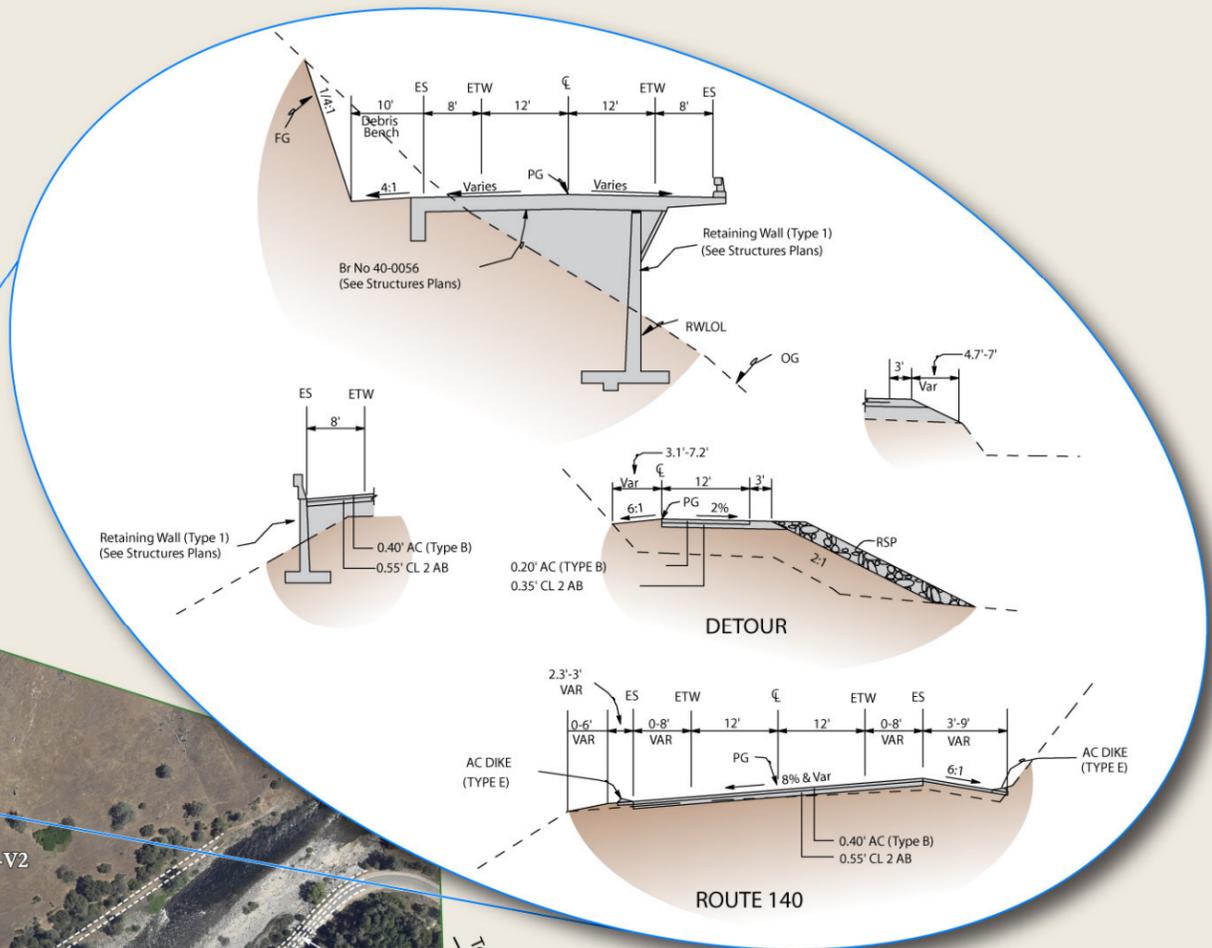
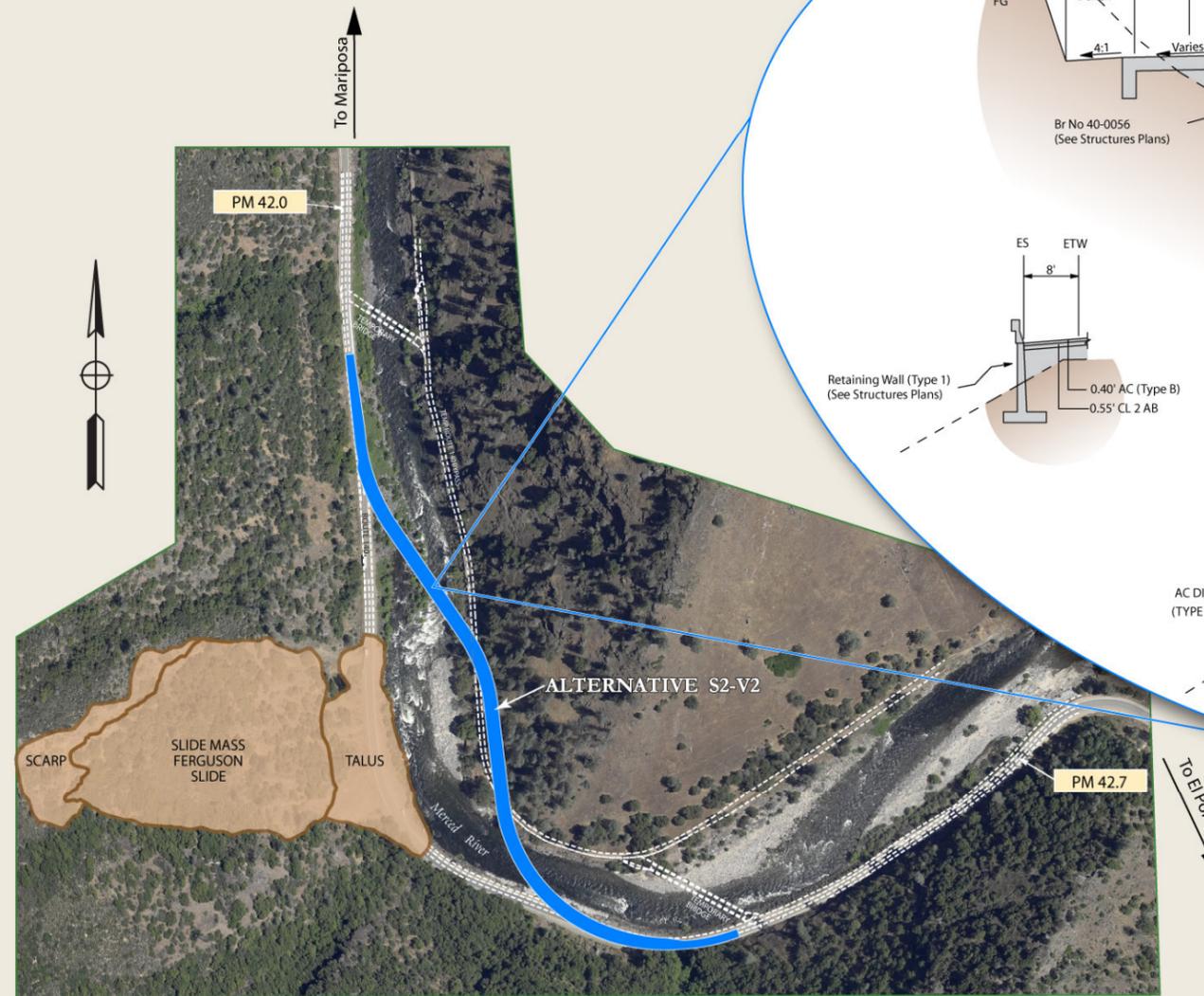
This variation requires the construction of two Tied-Arch bridges.



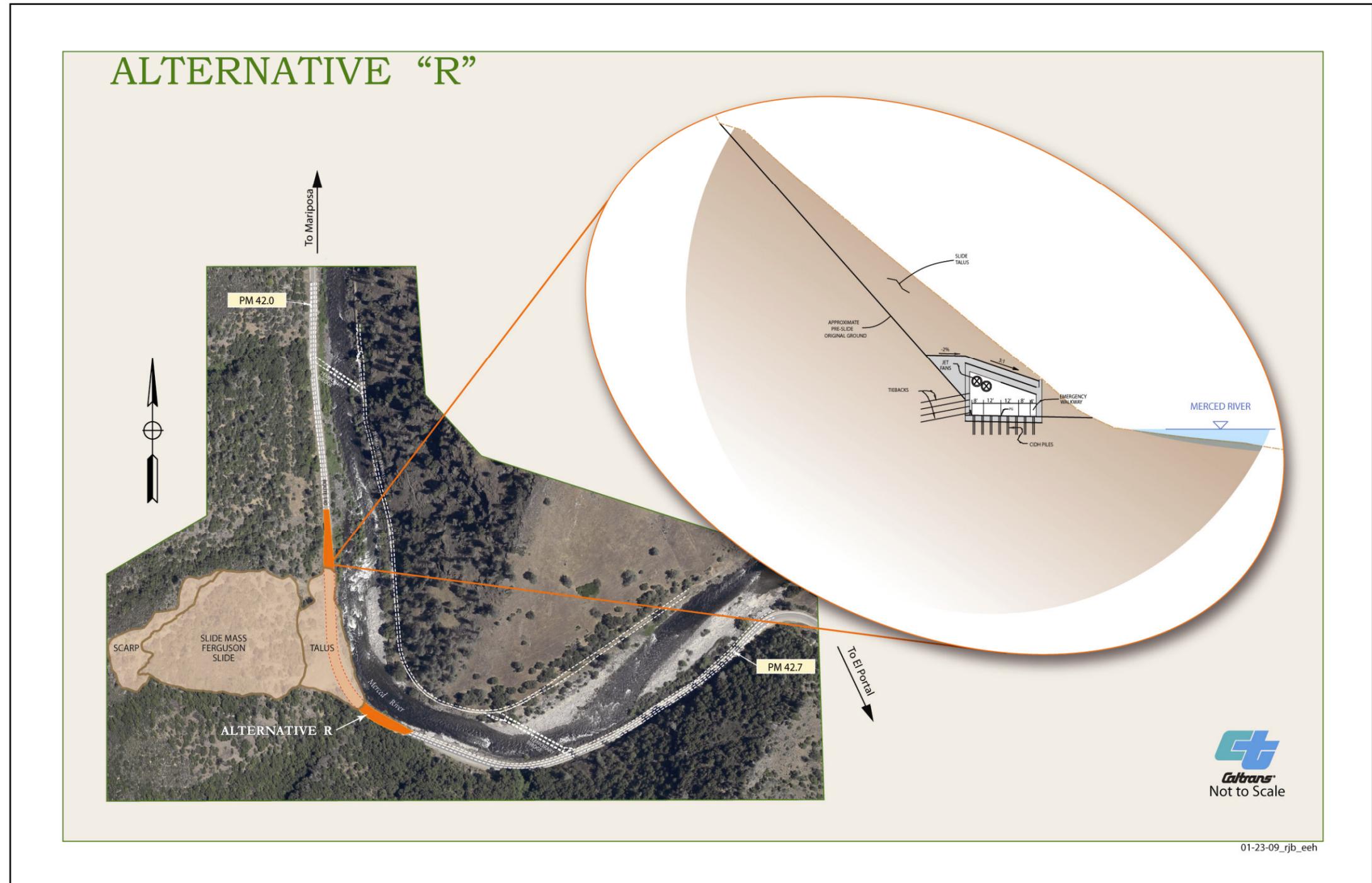
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ALTERNATIVE "S2-V2"

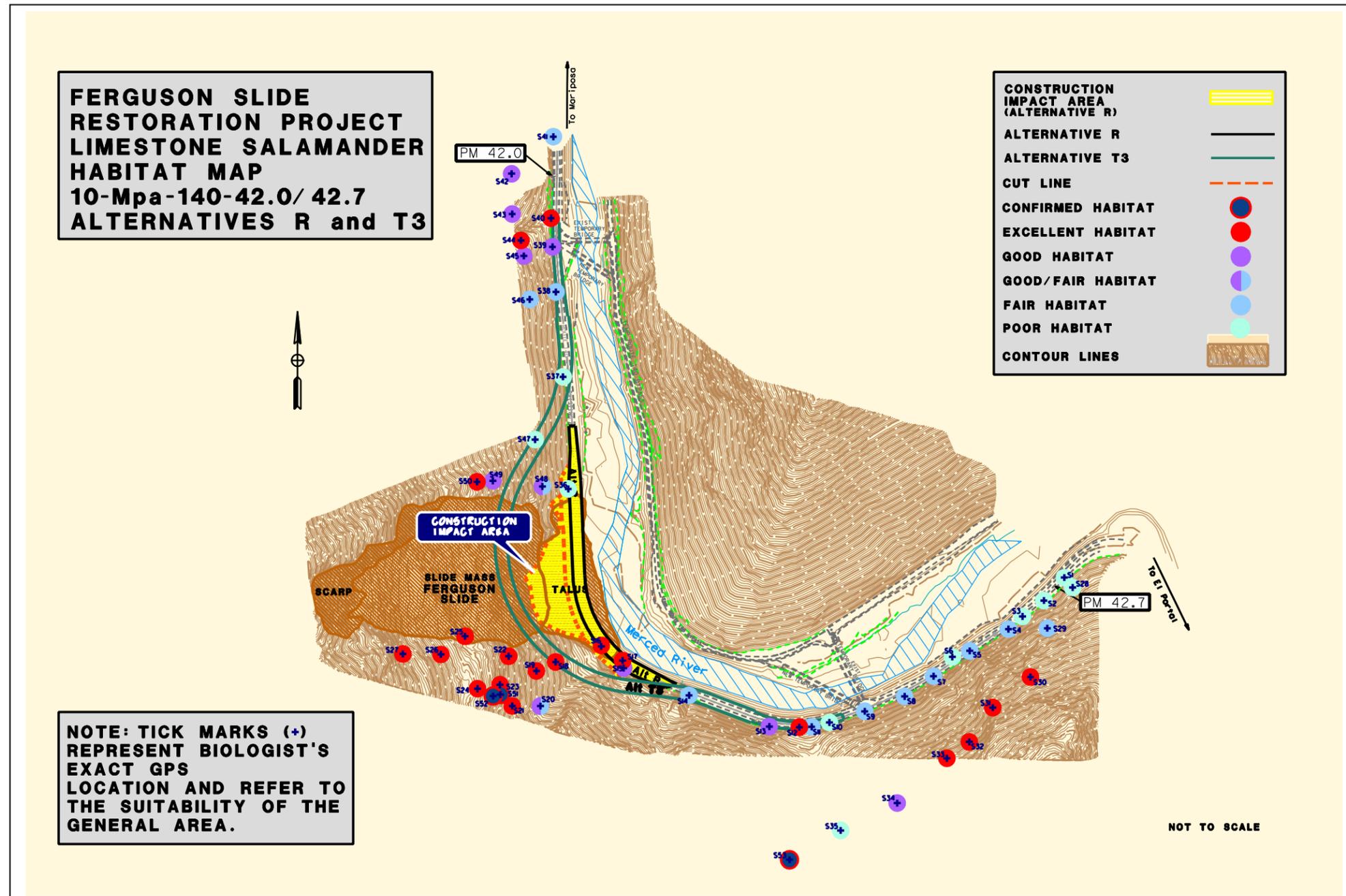
This variation requires the construction of two Slant-Leg bridges.



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Appendix G Limestone Salamander Habitat Map



List of Technical Studies that are Bound Separately

Air Quality Report
Noise Study Report
Water Quality Assessment
Natural Environment Study
Location Hydraulic Studies
Historical Property Survey Report:
 Historic Resource Evaluation Report
 Archaeological Survey Report
Initial Site Assessment
Visual Impact Assessment
Paleontology Identification Report
Geotechnical Design Reports
Economic Impact Report
Community Impact Assessment
River Geomorphology Report