Replacement of the Antlers Bridge (Bridge No. 06-0089)

SHASTA COUNTY, CALIFORNIA
02-SHA-5-PM R39.0/R41.2
378900

Draft Initial Study with Proposed Mitigated Negative Declaration / Environmental Assessment with Finding of No Significant Impact

Prepared by the
State of California Department of Transportation
and the
U.S. Department of Transportation
Federal Highway Administration

September 2006

General Information About This Document

What's in this document?

This Draft Initial Study/Environmental Assessment proposed Mitigated Negative Declaration/Finding of No Significant Impact (IS/EA) examines the potential environmental impacts associated with the Antlers Bridge replacement project on Interstate 5 in Shasta County, California. The document was prepared to comply with the California Environmental Quality Act and the National Environmental Policy Act respectively. It describes the purpose and need for the project, project alternatives, the existing environment and environmental factors that could be affected by the project, and potential impacts from each of the alternatives. Final selection of a project alternative will not be made until after the full evaluation of environmental impacts, consideration of public comments, and approval of the final Initial Study.

What should you do?

- Please read this IS/EA.
- We welcome your comments. If you have any concerns regarding the proposed project, please attend the public information meeting and/or send your written comments to Caltrans by the deadline. Submit comments via regular mail to:

  California Department of Transportation
  Cindy Anderson, Environmental Branch Chief
  Attention: Christopher Quiney
  Office of Environmental Management-MS30
  P.O. Box 496973
  Redding, CA 96049-6073

- You may submit comments via e-mail to chris.quiney@dot.ca.gov.
- Submit comments by the deadline: November 9, 2006

What happens after this?

After comments are received from the public and reviewing agencies, Caltrans may (1) give environmental approval to the proposed project, (2) undertake additional environmental studies, or (3) abandon the project. If the project were given environmental approval and funding were 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: Equal Employment Opportunity Officer, 1657 Riverside Drive, CA 96001; (530) 225-3055 Voice, or use the California Relay Service TTY number, (530) 225-2019.

SCH#
02-SHA-5-PM R39.0/R41.2
EA 378900

Replacement of the Antlers Bridge (Bridge No. 06-0089) on Interstate 5 in Shasta County near the Community of Lakehead

INITIAL STUDY WITH PROPOSED MITIGATED NEGATIVE DECLARATION / ENVIRONMENTAL ASSESSMENT WITH FINDING OF NO SIGNIFICANT IMPACT

Submitted Pursuant to: (State) Division 13, Public Resources Code
(Federal) 42USC 4332(2)(C)

STATE OF CALIFORNIA
Department of Transportation, and the

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration

_____
Date of Approval

_____
LENA R. ASHLEY
Office Chief
North Region Environmental Services, North
California Department of Transportation

_____
Date of Approval

_____
GENE K. FONG
Division Administrator
Federal Highway Administration
California Division

Proposed Mitigated Negative Declaration

Pursuant to: Division 13, Public Resources Code

Project Description

The California Department of Transportation (Caltrans), in cooperation with the Federal Highway Administration, proposes to replace the Antlers Bridge (Bridge No. 06-0089) on Interstate 5 in Shasta County near the community of Lakehead. The existing bridge has exceeded its service life, exhibits evidence of severe metal fatigue and is seismically deficient. In addition, it is proposed to realign a 0.42 mile section of Interstate 5 south of the bridge to improve safety. The accident rate on this section of Interstate 5 is higher than the average for similar highways statewide. The new bridge will be constructed adjacent to the existing bridge. Traffic will remain on the existing bridge during construction. The existing bridge will be removed once the new bridge is placed in service. New highway right-of-way will be required due to the change in highway alignment. Construction is expected to begin in 2008 and will take approximately three years to complete.

Determination

This proposed Mitigated Negative Declaration (MND) is included to give notice to interested agencies and the public that it is Caltrans' intent to adopt a MND for this project. This does not mean that Caltrans' decision regarding the project is final. This MND is subject to modification based on comments received by interested agencies and the public.

Caltrans has prepared an Initial Study for this project, and pending public review, expects to determine from this study that the proposed project would not have a significant effect on the environment for the following reasons:

The proposed project would have no effect on agricultural resources, cultural resources, and population and housing.

The project would have no long-term effect relative to air quality, hazardous materials, land use and planning, public services, recreation, transportation, and utilities.

The proposed project would not have a significant effect upon community resources or geology and soils.

The proposed project would not have a significant effect on visual resources, fish and wildlife, or water quality standards because the following mitigation measures would reduce potential effects to a level of less than significant:

- Abandoned segments of highway resulting from the realignment and temporary construction staging/access areas will be restored. Natural looking ground contours and planting of native plant species are proposed to improve the aesthetic quality of these areas.

- Percussive driving of large diameter piles will be confined to the period of August 15 to January 15 to avoid impacting nesting raptors.
- A bubble curtain will be utilized during percussive driving of large piles and in the case of underwater blasting to protect aquatic organisms.
- Streams within or immediately adjacent to construction areas that can be avoided will be designated as environmentally sensitive areas (ESA). Temporary fencing will be installed to protect ESAs from inadvertent impacts during construction.
- Removal of vegetation will be minimized to the extent necessary to construct the project. Vegetative buffers will be left in place where practicable.
- The project will include design features, special provisions, and temporary and permanent best management practices to avoid and minimize water quality impacts.

_____ _____

Brian Crane
District Director, District 2
California Department of Transportation

Date

Table of Contents

Cover Sheet i
Proposed Mitigated Negative Declaration ii
Table of Contents iv
List of Tables vi
Chapter 1. Proposed Project 1
1.1. Introduction 1
1.2. Purpose and Need 1
1.3. Project Description 2
1.4. Project Alternatives 3
1.4.1. Alternative A (The East Alignment) 5
1.4.2. Alternative A1 (Modified East Alignment) 5
1.4.3. Alternative B (The Straight Alignment) 5
1.4.4. Alternative C (No Build) 6
1.5. Alternatives Considered but Eliminated from Further Discussion 6
1.5.1. Alternative D (The West Alignment) 6
1.5.2. Alternative 5 6
1.5.3. Alternative 6 and 7 7
1.5.4. Alternative 8 7
1.6. Construction Process 7
1.7. Demolition of Existing Bridge 11
1.8. Permits and Approvals 12
Chapter 2. Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures 13
2.1. Land Use and Planning 13
2.1.1. Existing and Future Land Use 13
2.1.2. Impacts 13
2.1.3. Avoidance, Minimization, and/or Mitigation Measures 14
2.1.4. Consistency with State, Regional and Local Plans 14
2.1.5. Impacts 15
2.1.6. Avoidance, Minimization, and/or Mitigation Measures 15
2.1.7. Parks and Recreation 15
2.1.8. Impacts 16
2.1.9. Avoidance, Minimization, and/or Mitigation Measures 16
2.2. Cultural Resources 16
2.2.1. Impacts 17
2.2.2. Avoidance, Minimization, and/or Mitigation Measures 17
2.3. Visual/Aesthetics 18
2.3.1. Impacts 19
2.3.2. Avoidance, Minimization, and/or Mitigation Measures 19
2.4. Water Quality and Storm Water Runoff 20
2.4.1. Impacts 21
2.4.2. Avoidance, Minimization, and/or Mitigation Measures 24
2.5. Hazardous Waste 25
2.5.1. Impacts 26
2.5.2. Avoidance, Minimization, and/or Mitigation Measures 27
2.6. Noise 27
2.6.1. Impacts 28
2.6.2. Avoidance, Minimization, and/or Mitigation Measures 31
2.7. Air Quality 32
2.7.1. Impacts 32
2.7.2. Avoidance, Minimization, and/or Mitigation Measures 33
2.8. Vegetation 33
2.8.1. Impacts 34

2.8.2. Avoidance, Minimization, and/or Mitigation Measures 35
2.9. Fish and Wildlife 35
2.9.1. Impacts 36
2.9.2. Avoidance, Minimization, and/or Mitigation Measures 38
2.10. Cumulative Impacts 40
Chapter 3. Consultation and Coordination 42
Chapter 4. List of Preparers 44
Chapter 5. References 45
Exhibit 1 Project Vicinity Map 46
Exhibit 2 Project Location Map 47
Exhibit 3 Environmental Study Limits 48
Exhibit 4 Proposed Bridge Designs Under Consideration 52
Exhibit 5 Alternative Highway Alignments 53
Exhibit 6 Bridge Pier Options Under Consideration 54
Exhibit 7 Estimated Traffic and Construction Noise Levels 55
Appendix A California Environmental Quality Act Evaluation 56
Appendix B Resources Evaluated Relative to the Requirements of Section 4(f) 68
Appendix C Scoping Comments 70
Appendix D Title VI Policy Statement 74
Appendix E Summary of Avoidance, Minimization, and/or Mitigation Measures 75

List of Tables

Table 2-1 Definitions of Acoustical Terms 28
Table 2-2 Traffic Noise Impact Evaluation 29
Table 2-3 Typical Airborne Sound Levels Measured in the Environment and Industry 31
Table 2-4 Maximum Sound Pressure Levels Resulting from Pile Driving 37
Table 2-5 Definitions of Underwater Acoustical Terms 37
Table 2-6 Estimated Underwater Pressure Levels at Antlers Bridge 38

Chapter 1. Proposed Project

1.1. Introduction

The California Department of Transportation (Caltrans), in cooperation with the Federal Highway Administration, proposes to replace the Antlers Bridge (Bridge No. 06-0089) on Interstate 5 (I-5) in Shasta County near the community of Lakehead (Exhibits 1 & 2). The proposed project entails construction of a new bridge immediately east of the existing structure and realignment of a 0.42 mile section of I-5 to improve safety. Traffic will remain on the existing bridge during construction. When construction is complete, the existing bridge will be demolished. Approximately 14.5 acres of new highway right-of-way will be required due to the change in highway alignment. Land adjacent to I-5 is owned by the Department of Agriculture, Shasta-Trinity National Forest (STNF). Construction is scheduled to begin in 2008 and will require at least three years to complete.

The project is funded in the State Highway Operation and Protection Program (SHOPP) under the Bridge Rehabilitation Program (Program Code 20.10.201.110). This project is located on the National Highway System and is eligible for Interstate Maintenance Federal Aid Funds.

1.2. Purpose and Need

The purpose of the project is to provide a new highway crossing at the Sacramento River arm of Shasta Lake and to reduce the accident rate on the section of I-5 immediately south of the bridge.

The Antlers Bridge was built in 1941 by the Bureau of Reclamation. In 1967, the bridge was widened to accommodate increasing traffic volumes. The bridge has exceeded its design life and exhibits significant characteristics of aging. Structural fatigue, amplified by the increased stresses of the1967 widening, has resulted in failures in the superstructure and deck. An inspection in April 1985 by Caltrans' bridge maintenance staff revealed numerous cracks in steel members, cracked weld joints, and bolt failures. As a result of these findings, projects were initiated to retrofit the steel superstructure and rehabilitate the bridge deck. During the winter of 2003, a hole approximately one foot in diameter developed in the concrete bridge deck. Upon further inspection, it was determined that the concrete deck was deteriorating at an accelerated rate due in part to the weakening condition of the steel superstructure. An emergency project to replace the deck was completed in 2004.

Continued deterioration of the structure could lead to load restrictions, lane restrictions, and eventual closure.

Antlers Bridge is a key element of the I-5 corridor, located in an area where detours can cause considerable delays. Projected increases in future traffic volumes will increase the demand on the structure as the level of service (LOS)[1] progressively decreases. Failure to implement a scheduled, planned replacement could result in future detours due to deficiencies of this structure.

In addition to the bridge deficiencies, the section of highway immediately south of the bridge includes a series of curves on a six percent grade. The accident rate on this section of highway is higher than average for similar highways statewide. The following accident data was collected for the section of I-5 between post miles (PM) R39.40 and R41.40 for the period of April 1995 through March 2000:

- PM R39.40 to R39.70: Six incidents; property damage only.
- PM R39.70 to R40.00: Eleven incidents including one fatality and four injury incidents (five persons injured). The fatality was a single-vehicle, single occupant, DUI.
- PM R40.00 to R40.50: Sixteen incidents including five injury incidents (six persons injured).
- PM R40.50 to R41.40: Nine incidents; property damage only.

1.3. Project Description

The project entails construction of a new bridge immediately east of the existing structure and realignment of a 0.42 mile section of I-5 to improve safety. Traffic will remain on the existing bridge during construction. The existing bridge will be removed once traffic is diverted to the new structure. Temporary easements will be obtained for various construction access and staging areas to facilitate construction. Approximately 14.5 acres of new highway right-of-way will be required. Excess right-of-way resulting from the abandonment of a portion of the existing highway alignment will be offered for sale to the adjacent landowner, which is STNF. The project study limits are shown in Exhibit 3.

Construction is scheduled to begin in 2008 and will require at least three years to complete. The proposed bridge type is a five-span cast-in-place segmental concrete

[1] Level of Service (LOS) is a qualitative measure of operating conditions within a traffic stream, and their perception by motorists and/or passengers. A LOS definition generally describes these conditions in terms of such factors as speed, travel time, freedom to maneuver, comfort and convenience, and safety.

box girder structure (Exhibit 4). Bridge railing is steel with a linear, open appearance. The bridge will be supported by four sets of piers. The bridge will have two northbound lanes and three southbound lanes, one of which is an extension of the existing truck-climbing lane that begins at the south end of the bridge. The truck-climbing lane will be extended north to the railroad overcrossing. Roadway shoulders will be 10 feet in width with the exception of sections of I-5 with adjacent rocky cut slopes where additional shoulder width may be desirable to accommodate rock fall.

Utilities within the project limits include Pacific Gas & Electric electrical transmission lines and SBC, AT&T and Pacific Bell communications lines. SBC and AT&T have communication lines on the existing bridge, while PG&E does not. SBC, AT&T, and PG&E have requested a utility duct in the new bridge to provide a crossing of Shasta Lake. Caltrans will provide four-inch ducts within the bridge to accommodate these utilities. In addition, Caltrans Office of Structures has requested installation of electrical service on the new bridge for seismic monitoring equipment and maintenance lighting. It is anticipated that the service will be obtained from an existing underground PG&E service line near the intersection of Antlers Road and Antlers School Road.

1.4. Project Alternatives

Caltrans approved an internal document called a Project Scope Summary Report (PSSR) on September 5, 2001 to formally initiate the project development process. Project alternatives were developed based on preliminary traffic and engineering data, traffic and planning studies, and preliminary information concerning environmental resources. The PSSR considered eight project alternatives, including a “no-build” alternative. Five of the build alternatives were eliminated from further consideration because either they did not satisfy the project purpose and need or they entailed work that was beyond the scope of the current project. The “no-build” alternative and the remaining three build alternatives were carried forward in the PSSR for further evaluation. (Alternatives discussed in the PSSR were labeled numerically. However, in subsequent documents, the alternatives being carried forward were changed to an alpha designation.)

In 2004, a Value Analysis Team was assembled to analyze the project. Value Analysis is defined by Caltrans as “the process used to improve the quality and reduce the cost of transportation projects and other Caltrans programs.” The Value Analysis process was completed in May 2004 and recommendations were presented to Caltrans management in June 2004. The Value Analysis team recommended development of a new alternative, Alternative A1, which entailed modification of an

existing alternative. Alternative A1 became the preferred alternative because it best satisfies the purpose and need criteria while reducing project costs and potential impacts upon the environment. The project development team agreed with this recommendation, subject to public review. Final selection of a project alternative will not be made until after the full evaluation of environmental impacts, consideration of public comments, and approval of the final Environmental Assessment/Initial Study.

The project alternatives (Exhibit 5), except for the "no-build" alternative, entail construction of a new bridge on a different alignment. Bridge replacement on the existing alignment is not feasible because there is not a viable detour route available to accommodate traffic while the existing structure is demolished and the new bridge is constructed. In addition, a 0.42 mile section of I-5 south of the bridge will be realigned to improve safety. Due to the steep mountainous terrain at the south end of the bridge, it is necessary to shift the bridge alignment slightly to the east to attain the desired highway alignment.

Several types of bridges were considered, including suspension bridges, cable-stay bridges, steel truss and steel girder bridges, and concrete bridges with various pier and span configurations. The major factors considered in bridge type selection include the costs for construction and maintenance; physical constraints due to the long span, recreational boating requirements, and fluctuating water level of Shasta Lake; and environmental constraints such as the proximity of an existing public boat ramp and a culturally sensitive area.

Suspension and cable stay bridges are more costly than other types of structures due in part to the fact that they are difficult to build on curved alignments. A straight bridge alignment in this case is not desirable because it would require a longer structure, which is more costly. In addition, due to the steep terrain at the south end of the bridge, substantial embankments and earth retaining structures would be necessary. This would result in additional construction and right-of-way acquisition costs and destruction of upland and stream habitat.

Steel bridges require more maintenance than concrete bridges and an intensive inspection regime to assess structural fatigue. In addition, a steel bridge with satisfactory fatigue resistance would require additional piers in the water. The placement of piers could result in a conflict with recreational boaters on Shasta Lake and the Antlers public boat ramp. The steel arch structure considered for this project was estimated to be more than two times the cost of a concrete bridge.

Different types of concrete bridges were considered, including various pier and span configurations. Concrete bridges are cost effective, low maintenance, and can be modified easier than a steel structure, and can easily accommodate a curved

alignment. The preferred bridge type is a concrete cast-in-place segmental box girder with large diameter piles. The box girder structure was chosen for its long span potential, aesthetic qualities, durability, and competitive cost. Large diameter piles will allow longer spans, which reduce interference with the public boat ramp and provide more open water for boaters and lake recreation.

1.4.1. Alternative A (The East Alignment)

Alternative A entails construction of a new bridge immediately east of the existing structure. The bridge would have a slight curvature (2,950 foot radius). The roadway immediately south of the bridge would be shifted to the east to improve the radii of a reversing ("S") curve, from approximately 1,000 feet to 1,300 feet. A large embankment and earth retaining structure would be necessary due to steep terrain east of the existing roadway. This alternative satisfies the project "purpose and need" by providing a new crossing at the lake, but it does not provide an optimal alignment for this type of highway. An optimal alignment, based upon modern highway design standards for this section of highway, would have a curve radius of at least 2,000 feet. In addition, the large embankment and earth retaining structures would significantly increase the cost of the project due to increased labor and material costs and the need for additional right-of-way.

1.4.2. Alternative A1 (Modified East Alignment)

Alternative A1, which was developed during the Value Analysis process, is a modified version of Alternative A. Relative to the other alternatives, Alternative A1 offers a better roadway alignment, constructability, and minimization of environmental impacts. It differs from Alternative A in that the roadway alignment south of the bridge is shifted westward to eliminate the need for large embankments and substantial earth retaining structure to span the steep terrain east of the existing highway. This would save substantial construction and right-of-way acquisition costs, and reduce impacts to upland and stream habitat. Shifting the roadway alignment westerly also facilitates straightening this section of highway. The bridge alignment is slightly curved, but less so than the existing bridge. The alignment of Alternative A1 is far enough from the public boat ramp to avoid conflicts with boating activities. The roadway north of the bridge would conform to the existing roadway alignment prior to crossing under the Union Pacific Railroad Underpass.

1.4.3. Alternative B (The Straight Alignment)

Alternative B entails construction of a new bridge with a straight alignment east of the existing bridge. The section of highway south of the bridge would be realigned to produce one curve with a radius of 2,000 feet. This alternative satisfies the project

"purpose and need", however, it is more costly than the other alternatives due to the added length. In addition to the longer structure, a substantial embankment and earth retaining structure would be required between the southern bridge abutment and the highway. Alternative B would result in greater impacts to upland and stream habitat, additional right-of-way requirements, increased potential for erosion, increased maintenance of embankments, and increased construction costs. In addition, Alternative B is close to the public boat ramp and it is likely that one of the bridge piers would interfere with ramp operations to the extent that the ramp would need to be relocated or realigned.

1.4.4. Alternative C (No Build)

The "no build" alternative preserves the existing bridge and highway alignment. This alternative neglects the bridge's escalating structural problems and the higher than average accident rate associated with the roadway alignment. The "No Build" alternative will result in excessive maintenance costs, which could quickly exceed the cost of a bridge replacement project. A structural failure could result in closure of the bridge for an undetermined period of time, during which, all traffic using the interstate would be required to take an alternate route. There are no viable detour routes available.

1.5. Alternatives Considered but Eliminated from Further Discussion

1.5.1. Alternative D (The West Alignment)

Alternative D proposed construction of a new bridge immediately west of the existing bridge. The bridge alignment would require a sharper curve radius than what currently exists in order to conform with the highway alignment north and south of the bridge. The curves south of the bridge would not be improved.

This alternative was eliminated from further consideration because it does not eliminate the operational and safety deficiencies on this section of highway.

1.5.2. Alternative 5

Alternative 5 proposed replacement of the existing bridge in the same location. During demolition of the existing bridge and construction of the new bridge, traffic would be detoured between Redding and Mount Shasta via State Routes 299 and 89 through Burney. This detour route is apprioximately 111 miles in length compared to the distance of 60 miles on I-5 between Redding and Mount Shasta. This alternative does not improve the highway alignment south of the bridge.

Alternative 5 was eliminated from further consideration due to the lack of a viable detour and because it does not eliminate the operational and safety deficiencies on this section of I-5.

1.5.3. Alternative 6 and 7

Alternatives 6 and 7 are similar in that they entail a realignment of I-5 from the south end of the Antlers Bridge southerly to a location north of the Gilman Road/Salt Creek Interchange. The alignments differed somewhat, but both would require extensive earthwork due to the steep terrain in this area. New right-of-way would be required.

Although these two alternatives improve the safety and operational aspects of the highway, they require extensive highway reconstruction work that is beyond the scope of this bridge replacement project.

1.5.4. Alternative 8

Alternative 8 would elevate the section of I-5 at the north end of the bridge to create a railroad overpass in place of the existing Antlers Railroad Underpass (Bridge #6-47). The new section of freeway would join the existing elevation of I-5 near the interchange ramps south of the Lakeshore Drive/Antlers Road Undercrossing at postmile R40.9. This alternative would eliminate the one constraint faced by other alternatives, which invovles connecting the north end of the structure to a designated point (elevation) on I-5 prior to the Antlers Railroad Underpass. This alternative does not improve the highway alignment south of the bridge.

This alternative was eliminated from further consideration because the effort and cost involved in raising the section of I-5 at the north end of the bridge exceeds the scope of the proposed project. In addition, this alternative does not address the operational and safety deficiencies on the section of I-5 south of the bridge.

1.6. Construction Process

The methods and scheduling of construction activities will be determined by the contractor. Project specifications will identify the desired outcome for each aspect of the project, for example, “remove existing bridge piers to an elevation one foot below original ground.” The contract provisions will not always direct how the work is to be performed. The contractor could therefore use any construction method not specifically prohibited in the contract provisions. Aside from the availability and cost of equipment and materials, a major factor that can affect the project schedule and construction methods is the fluctuating lake level. The water level in Shasta Lake is controlled by the Bureau of Reclamation for the main purposes of providing irrigation

and flood control. During an average year, drawdown begins in June for irrigation and continues through the summer. The drawdown continues into the winter for flood control purposes. Recharge of the lake level begins with the winter rains. During an average year, the main piers of the existing bridge will be situated in a maximum water depth of approximately 100 feet. During the drawdown cycle, the water level recedes 50 to 65 feet. However, due to variations in climate patterns, such as droughts and extremely wet years, it is not possible to predict what the lake level will be at any given time. The fluctuating lake level and unpredictable climatic changes therefore can be a major influence on the schedule and choice of construction methods.

Following is an estimation and examples of construction processes that may be used for this project based on existing site conditions and standard construction practices:

The contractor will need access to the lake and areas for construction staging. Caltrans has identified several areas to accommodate these needs. The construction access and staging areas have been evaluated for California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) compliance and, if applicable, temporary easements will be obtained. Public campgrounds and boat ramps will remain open during construction and will not be available for construction related use pursuant to the provisions of Section 4(f) of the Department of Transportation Act of 1966 (See Appendix B). Following are the areas proposed for the contractor's optional use as temporary construction access and staging areas:

A) An area of approximately 8 acres on STNF land with lake frontage located near the northwest corner of the Antlers Bridge. This area will be used for staging construction operations and storage of materials and equipment. An easement will be obtained on the lakeshore to provide the contractor with the option of constructing a temporary dock or ramp to gain access to the lake. A ramp would likely extend to the low water level. Construction of a ramp could require the importation of up to 119,000 cubic yards of clean rocky material. Suitable material may be available from excavations that will occur at Haycock Peak for the new highway alignment. If necessary, rock can be imported from a commercial source. The material used to create the access ramp would be removed from the lake following construction and the lakeshore would be returned as close as possible to its pre-construction condition.

B) Approximately 2.3 acres are available immediately east of I-5 at the northern bridge abutment. This is the area where the northern abutment of the

proposed bridge will be located. Consequently, extensive earthwork will occur at this location.

C) An easement is available for construction of a 30 foot wide temporary access road and ramp immediately west of the Antlers public boat ramp parking lot and northerly of the boat ramp. An additional area of approximately one acre is included for staging. The temporary construction ramp would be situated so it does not interfere with the operation of the public boat ramp. This area is a supplemental access point for construction. Following construction, the area will be restored to pre-construction conditions or to an agreed upon condition as determined by STNF.

D) The wide area adjacent to the traveled way, within the highway right-of-way, at the south end of the bridge.

Traffic will remain on the existing bridge during construction. Periodic traffic control will be necessary, especially during activities associated with the realignment of I-5. It is likely that barges will be used extensively for bridge foundation construction, bridge assembly, transport of materials, workers and equipment, and demolition of the existing bridge. The contractor may choose to construct a system of temporary roads, bulkheads, docks, trams, and/or conveyor belts to load and unload barges. A staging area will be required on the lakeshore from which barges can be loaded and unloaded.

Due to the need for substantial amounts of Portland cement concrete (PCC), it is anticipated that the contractor will establish a temporary PCC batch plant close to the work site. Adequate supplies of PCC are available from commercial plants in Redding and Mount Shasta. However, due to the distance, it is unlikely that the contractor will utilize these sources. Establishment of a temporary batch plant will require the contractor to obtain an operating permit from the California Air Resources Board (CARB). It will be necessary for the contractor to perform CEQA studies pertaining to air quality, noise levels and possibly other environmental factors related to the operation of a temporary batch plant. Caltrans has conducted biological and archaeological studies to provide an area for such operations. However, it was not possible to conduct all of the necessary studies because the analysis is dependent upon such factors as type, size, and period of operation of the plant, which will not be known until construction begins.

Bridge construction will begin with the piers and abutments. The new bridge has an abutment at each end and four piers in between. The two outer piers consist of two individual piles each and the two inner sets consist of four piles each. Preliminary estimates indicate that each pile will be approximately 13.1 feet in diameter.

Construction of the piers entails driving the steel pile shells into the lakebed until an adequate seal is formed at the bottom of the shell. The steel shells will probably be limited to lengths of approximately 30 feet to facilitate transport and handling. An auger will then be inserted into the shell and a hole will be drilled to the specified foundation depth, approximately 140 feet below the surface of the lakebed. It may be necessary to dewater the shells during drilling if water seeps in. Drill cuttings will either be deposited on the lakebed or removed and disposed of at an upland location. It is estimated that the twelve piles will generate between 3,000 and 7,300 cubic yards of drill cutting material. Additional shells will be spliced (welded) on top of the initial shell. The process will be repeated until the superstructure elevation is reached. Reinforcing steel will be installed within the shells prior to pouring the concrete. The steel shells function as forms and are not a structural element of the bridge. They can be left in place or removed once the concrete is cured depending on the desired aesthetic effect. Concrete shrouds can also be utilized, at additional expense, to enclose the piers. The abutment foundations will utilize smaller piles, approximately three feet in diameter. Upon completion of the piers and abutments, construction of the superstructure and bridge deck will begin via the balanced cantilever method. This process entails forming and constructing the horizontal structure outward from the piers in each direction, in equal (balanced) proportions, until the superstructure/deck segments meet at mid span. Each section of deck will require substantial amounts of reinforcing steel and concrete. The bridge deck, from curb to curb, will be approximately 100 feet in width. Each pile, abutment, and deck segment will require a continuous concrete pour. Depending on the method of concrete delivery, some pours could continue for more than 24 hours at a time. In addition to concrete pours, night work may be required for auguring the massive pier piles.

Realignment of the highway will require cuts and fills that will generate approximately 236,700 cubic yards of excess material. The material will be used on-site to restore the temporary construction staging areas and the sections of I-5 abandoned as a result of the highway realignment. Any excess material will be disposed of within Caltrans right-of-way or at a site approved by the Caltrans resident engineer. Approved disposal sites within Caltrans right-of-way include an area adjacent to the northbound lanes of I-5, five miles north of the bridge at post mile 45.0 and a bench adjacent to the southbound lanes of I-5 between post miles 38.35 and 38.65. The site at post mile 45.0 is a segment of former State Route 99 that was abandoned when I-5 was constructed. The site is being developed to restore the natural contours and will be planted with native species once final grading is complete. The site between post miles 38.35 and 38.65 is a large embankment with a 40 foot wide bench near the bottom. The embankment would need to be cleared of vegetation prior to placing additional fill. If the ccontractor requests use of an alternate disposal

site(s), it will be necessary for the contractor to provide the Caltrans resident engineer with evidence that an evaluation of the site was performed pursuant to the CEQA and applicable permits have been obtained.

1.7. Demolition of Existing Bridge

Following completion of the new bridge and realignment of I-5, traffic will be diverted to the new bridge and the old bridge will be removed. The existing bridge is a continuous span steel truss structure supported by six concrete piers. The piers are approximately 10 feet thick, 40 feet wide, and up to 150 feet in height. The piers have hollow cells throughout and contain substantial amounts of reinforcing steel.

The first step in the demolition process is removal of the concrete deck. A catchment system will be installed to prevent demolition debris from entering the water. A catchment system could be affixed to the bridge itself, to a crane barge, or a barge by itself can be used to catch debris. The deck will be removed in manageable sections, most likely with the use of a pneumatic or hydraulic hammer and a cutting implement to sever the reinforcing steel. Following removal of the deck, the steel superstructure will be disassembled. Once disassembly of the steel trusses begins, the structure will become unstable and a temporary support system will be necessary. The support system would likely consist of steel piles driven into the lakebed. Disassembly of the structure might be done with explosives or via piecemeal flame cutting and removal by crane. This work may occur when the lake is full so barges and cranes can easily reach the structure. Following removal of the superstructure, the concrete abutments and piers will be removed. This might occur during the period between September and January when the lake is at its lowest level. Potential methods for demolishing the bridge piers include, but are not limited to, explosives, diamond-wire saw cutting, stitch drilling, toppling, chemical demolition agents, mechanical splitters, hydro-demolition (water blasting), and oxygen thermal lance (flame-cutting). These are all viable demolition methods that work underwater and could be employed at the Antlers Bridge. Demolition of the piers and abutments will result in approximately 4,063 cubic yards of concrete rubble, including reinforcing steel.

An optional disposal site for steel and concrete waste generated by bridge demolition will be designated in the contract. Use of an alternate disposal site will require the contractor to provide the Caltrans resident engineer with evidence that an evaluation of the site was performed pursuant to the CEQA and that applicable permits have been obtained.

The abandoned highway alignment will be obliterated. The pavement will be broken up and removed or buried onsite within the highway embankment. Final construction operations will include final grading and restoration of staging areas, installation of miscellaneous fencing, installation of rock slope protection (RSP) and other erosion control items, and installation of signing and traffic striping.

1.8. Permits and Approvals

Agency	Permit/Approval	Requirement
California Department of Fish & Game, Region 1	Stream/Lakebed Alteration Agreement [Section 1602 Fish and Game code]	Required for construction/demolition activities within lake and streams. Permit to be obtained by Caltrans.
United States Army Corps of Engineers, Sacramento District	Department of the Army Permit [Section 404 of the Clean Water Act]	Required for construction/demolition activities within lake, stream & wetlands. Permit to be obtained by Caltrans.
Regional Water Quality Control Board, Central Valley Region	Water Quality Certification [Section 401 of the Clean Water Act]	Pre-requisite for Army Corps permit. Water Quality Certification to be obtained by Caltrans.
Regional Water Quality Control Board, Central Valley Region	Dewatering permit [National Pollutant Discharge Elimination System]	Necessary for dewatering if discharge will enter a water body. Permit to be obtained by contractor.
California Air Resources Board	Permit to operate a temporary Portland cement concrete plant; Notification prior to demolition of existing bridge per NESHAP and CARB rules.	Required for all bridge demolition or renovation work. Notification to be made by contractor.
U.S. Department of Agriculture, Shasta-Trinity National Forest	STNF is a cooperating agency for NEPA compliance. Additionally, approval is required for temporary and permanent easements upon STNF land.	Caltrans will obtain authorization for temporary and permanent easements needed for construction and highway right-of-way.
U.S. Department of the Interior, Bureau of Reclamation	Right-of-Use Authorization	Required for any work within Lake Shasta. Caltrans to obtain authorization.
U.S. Fish & Wildlife Service	Section 7 consultation for threatened and endangered species (Bald Eagle)	Caltrans has completed consultation for bald eagle. Letter of concurrence received on November 9, 2005

Chapter 2. Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

2.1. Land Use and Planning

2.1.1. Existing and Future Land Use

The unincorporated community of Lakehead is located at the north end of Antlers Bridge. Lakehead is bisected by I-5 and has a population of approximately 550 residents. The community is served by the Lakeshore Drive/Antlers Road and Riverside Drive interchanges.

Land use in the project vicinity is zoned for highway, public recreation, and commercial and residential development. Commercial development is concentrated near I-5. Many of the businesses cater to lake recreation and interstate travelers, which are vital to the local economy.

Shasta Lake is a component of the Central Valley Project, which is administered by the U.S. Department of the Interior, Bureau of Reclamation. The purpose of the lake is as follows according to priority: 1) flood control 2) irrigation, municipal and domestic water supply 3) hydro-electric power generation 4) recreation. A program called CALFED was established in 1995 to address environmental and water management issues associated with the bay-delta system. Through this program, State and Federal agencies coordinate their regulatory and/or management responsibilities over bay-delta resources. The Bureau of Reclamation is currently proposing a project to enlarge Shasta Dam to increase the storage capacity of Shasta Lake. Alternatives being evaluated by the Bureau include raising the height of the dam between 6.5 and 18.5 feet.

2.1.2. Impacts

During the construction and demolition processes, boat traffic and recreational activities on the lake in the vicinity of the bridge will be restricted to designated areas and routes to ensure the safety of the public and construction workers. Traffic control on the lake will include the use of speed restrictions, buoys, and signs in addition to the intermittent use of boats to direct and monitor lake traffic.

Realignment of the bridge and highway will require temporary lane closures and detours on I-5 during construction. This will involve speed reductions within the project limits and various types of lane cross-overs and lane closures to facilitate the highway improvement work.

The proposed bridge would accommodate an increase in the full pool elevation of Shasta Lake up to 18.5 feet as proposed by the Bureau of Reclamation. However, the northern bridge abutment would be located within the high water level of the lake. The Bureau of Reclamation's current proposal includes construction of a levee system to protect the Lakeshore area, including the highway and bridge abutment from inundation. Alternatively, moving the bridge abutment beyond the inundation zone would lengthen the bridge by 89 feet at an additional cost of approximately $4.5 million.

2.1.3. Avoidance, Minimization, and/or Mitigation Measures

A route will be maintained for boat traffic beneath the bridge during construction. The route will change as construction and demolition activities progress. The Antlers public boat ramp will not be affected by construction, but movement near the toe of the ramp may be restricted due to the proximity of the construction area.

A traffic management plan will be in place to ensure that traffic impacts on I-5 are minimized to the extent possible. Access to interchanges, local streets, businesses and public facilities will be maintained throughout the construction process.

Intermittent, short-term closures of the highway or lake area may be necessary for certain situations, such as blasting, moving large equipment or materials into place, etc. News releases will be provided immediately prior to and during construction to advise the public of construction activities and restrictions that may affect highway traffic or lake use.

2.1.4. Consistency with State, Regional and Local Plans

I-5 is part of the National Highway System, the Interregional Road System, and is designated as a high emphasis route in the 1998 Interregional Transportation Strategic Plan (ITSP). High emphasis routes are classified as being the most critical interregional road system routes for interregional travel and the state as a whole. Replacement of the existing structure is consistent with the ITSP. I-5 in the project vicinity is a bicycle route.

The proposed project is listed in the 2004 Shasta County Regional Transportation Plan (RTP). The project is also consistent with state transportation plans. The

Transportation Concept Report (TCR), which is maintained by Caltrans and is currently being updated, estimates future transportation needs on the state highway system. The proposed bridge will have a design life of 100 years and therefore should be designed to accommodate traffic needs for the next 100 years.

2.1.5. Impacts

The proposed project will provide three traffic lanes in the southbound direction, which will be sufficient for the life of the structure, and two lanes in the northbound direction. The Caltrans District 2 Division of Planning utilized traffic data from 1979-2003 to estimate future traffic volumes and lane requirements on I-5 in the vicinity of the Antlers Bridge. The future traffic projections are based on an average historic growth in average daily traffic of 436 vehicles per year during the twenty-five year period noted above. This growth trend is expected to continue at a steady rate as the population of California continues to grow. Based on this projection, it is estimated that an additional lane will be requried in the northbound direction in the year 2045.

2.1.6. Avoidance, Minimization, and/or Mitigation Measures

When the need arises, it will be necessary to provide the additional width, or, depending on highway design standards for shoulder width at that time, request a highway design exception for less than standard shoulder width.

Outside shoulder width will ultimately accommodate bicyclists. The bridge will also have bicycle railing on top of bridge railing and bicycle friendly grates on outside shoulders.

2.1.7. Parks and Recreation

The Antlers Bridge spans the Sacramento River arm of Shasta Lake and is located within the Shasta-Trinity National Recreation Area. STNF administers recreational use of the lake and surrounding forest, including several campgrounds, marinas, and a public boat ramp. The Antlers Boat Ramp and Campground are located immediately northeast of the bridge. The Gregory Creek Campground is located approximately 0.8 mile northeast of the bridge and the Lakeshore East Campground is located approximately 0.6 mile southwest of the bridge. These facilities experience heavy use during the summer months. There are no services or developed recreational facilities at the south end of the bridge.

2.1.8. Impacts

STNF estimates that an average of 30 feet of vertical clearance will be needed at the new bridge during full pool to provide passage for large houseboats. In addition, STNF requested that bridge piers be placed no closer than 300 feet within the toe of the public boat ramp to avoid conflicts with ramp activities. An attempt was made to locate piers at least 300 feet from the toe of the boat ramp. However, due to cost and structural limitations, the farthest pier #5 can be located from the toe of the boat ramp is approximately 250 feet, 50 feet short of the desired distance. Although it is less than the desired distance of 300 feet, neither Caltrans nor STNF foresee any adverse effects to boat ramp activities based on the proposed pier layout.

Construction of the proposed bridge and realignment of I-5 will require the acquisition of approximately 14.5 acres of new right-of-way from Shasta-Trinity National Recreation Area.

2.1.9. Avoidance, Minimization, and/or Mitigation Measures

The new bridge will be 1,936 feet in length and will have a design life of 100 years. With the exception of the northern span, the bridge will provide an average of 30 feet of vertical clearance for houseboat passage at full pool water level assuming a future maximum increase in full pool elevation of 18.5 feet as proposed by the Bureau of Reclamation. The proposed bridge has longer spans and two less piers in the lake than the existing bridge. Navigation and recreation on the lake will therefore be improved.

The Antlers boat ramp and Campground will remain open during construction. No use of these facilities will occur for construction of the proposed project.

New highway right-of-way will be acquired through a land exchange, as appropriate, between Caltrans and STNF.

2.2. Cultural Resources

The National Historic Preservation Act of 1966 (NHPA), 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 NHPA requires federal agencies to take into account the effects of their undertaking 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 CFR 800). On January 1, 2004, a Section 106 Programmatic

Agreement (PA) among the Advisory Council, FHWA, State Historic Preservation Officer (SHPO), and Caltrans went into effect for Caltrans projects, both state and local, with FHWA involvement. The PA takes the place of the Advisory Council's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans.

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

There is abundant evidence of prehistoric occupation in the project vicinity due to the geography and vast amount of natural resources associated with the Sacramento River. Subsequent land use activities included fur trapping, gold mining, railroad transport, timber harvesting, and mining for copper ore. Shasta Dam was completed in 1945, at which time the reservoir was filled. The existing Antlers Bridge was constructed by the Bureau of Reclamation in 1941. The bridge was evaluated (Lortie 2001) for eligibility for listing in the National Register of Historic Places but was determined to be ineligible because post construction alterations have compromised the integrity of the original structure.

2.2.1. Impacts

No historic properties will be affected by the project. One cultural resource, CA-SHA-676, was identified within the project's area of potential effects (APE). This resource was not evaluated for inclusion in the National Register of Historic Places because it is located beyond the area of direct impact, below the ordinary high water level of Shasta Lake, and will be designated as an environmentally sensitive area (ESA) on the project plans. Stipulation VIII.C.3 of the Programmatic Agreement for implementing Section 106 of the National Historic Preservation Act provides that this archaeological site can be protected by an ESA and for the purposes of this specific undertaking be considered eligible for the National Register of Historic Places without surface excavation. Because this resource is being protected pursuant to the Programmatic Agreement, it will also be addressed in Appendix B "Resources Evaluated Relative to the Requirements of Section 4(f).

2.2.2. Avoidance, Minimization, and/or Mitigation Measures

To protect cultural resource CA-SHA-676, the limits of the resource will be designated as an ESA. An ESA action plan has been developed, which prescribes

protection measures. No work will be permitted within the ESA. During high water, buoys will placed at strategic locations to delineate the ESA. If the lake level recedes and the site becomes exposed, temporary fencing will be installed around the site boundary. In addition, routine monitoring by Caltrans archaeological staff will be conducted.

2.3. Visual/Aesthetics

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 and culturally pleasing surroundings [42 United States Code 4331(b)(2)]. To further emphasize this point, the Federal Highway Administration in its implementation of the National Environmental Policy Act [23 United States 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." [California Public Resources Code Section 21001(b)]

The Antlers Bridge spans the Sacramento River arm of Shasta Lake on I-5. The existing bridge is a seven-span steel truss structure approximately 1,329 feet in length and is painted green. I-5 within the project limits is a four lane interstate highway with a southbound truck climbing lane beginning at the southern end of the bridge. A substantial highway cut is evident near the southwest corner of the existing bridge. The rural community of Lakehead is located at the north end of the bridge. Several public campgrounds and a boat ramp, administered by STNF, are located on the banks of Shasta Lake immediately east of the bridge. The outlying area is mountainous, forested terrain. Other notable features in the project area include a rock outcrop that flanks the public boat ramp, an ephemeral cascading stream located on the banks of Shasta Lake between the northern bridge abutment and the public boat ramp, and a pair of bridges spanning Doney Creek, northwest of the Antlers Bridge. The bridge in the forefront is a steel truss bridge for the railroad. Behind it is a concrete arch bridge on the county road system.

2.3.1. Impacts

The most obvious change in the landscape resulting from the project will be the introduction of a larger, modern concrete structure in place of the steel truss bridge, and the realigned section of highway. The proposed bridge is a five-span concrete structure supported by four sets of large diameter piles. The soffit of the bridge deck will have a gentle arch that gives the bridge deck a slender appearance and aids in the transition to the large piers. Several variations of the bridge design are being considered as shown in Exhibit 4. The variations focus mainly on pier treatments and the area where the piers meet the deck. Exhibit 6 shows close-up photo renditions of several options under consideration. The final bridge design may vary slightly from these photo renditions.

An addition to the newly aligned section of highway will be 0.5 mile of wire mesh deer fence on each side of the highway. The fencing will be six feet in height with steel posts every ten feet. The fencing will be located as far as possible from the traveled way near the right of way boundary.

Temporary impacts resulting from construction include land clearing and grading to create construction access and staging areas, cuts and fills associated with the roadway realignment, and the abandoned sections of highway. Construction access and staging areas that will require clearing and will be visible from the highway and the lake include the areas immediately east and west of the northern bridge abutment.

Albeit temporary, the scope of this transportation project will be readily apparent once the construction staging and access areas are occupied by large construction equipment and material stockpiles.

2.3.2. Avoidance, Minimization, and/or Mitigation Measures

Several options for pier treatment are being considered (Exhibit 6). The steel shells used to construct the piles function as forms and are not a structural element of the bridge. They can be left in place or removed once the concrete is cured depending on the desired aesthetic effect. Caltrans proposes removal of the steel shells for aesthetic reasons. Also under consideration for aesthetic reasons is the addition of concrete shrouds to enclose the piles of the two center pier groups. This gives the effect of the piers being comprised of two individual piles instead of four. The shrouds would add approximately $21 million to the cost of the bridge.

The abandoned section of highway south of the bridge will be obliterated and graded to conform with the adjoining topography. Native shrubs and trees will be planted in disturbed areas beyond the clear recovery zone of the highway, which is typically 20

feet from the edge of pavement. If rock slope protection is required to stabilize embankments or drainages, native rock from highway excavations will be used to match the color of the surrounding ground.

Removal of large trees within access and staging areas will be avoided to the extent practicable, i.e., they will be left in place if they do not interfere with construction activities. Typically the entire staging area would be cleared and grubbed to facilitate construction activities. However, an attempt will be made to preserve several of the larger pine and oak trees along the eastern edge and the southeast corner of the 12 acre staging site as a visual screen. Several large conifers adjacent to an osprey nest will be left in place to provide a screen and potential roosting site for the osprey. These trees will be designated as an ESA and delineated with temporary fencing. The vegetated segment of a small perennial drainage that bisects the proposed staging area will be protected with temporary ESA fence. The ephemeral stream between the boat ramp and bridge will also be protected with an ESA fence. Following construction, temporary construction access and staging areas will be restored in a manner similar to the abandoned sections of highway. The rocks creating the cascade will not be affected, nor will the rock outcrop at the public boat ramp.

2.4. Water Quality and Storm Water Runoff

The project is located within the Sacramento River Drainage Basin. The primary federal law regulating water quality is the Clean Water Act. Section 401 of the Act requires a water quality certification from the State Water Resources Control Board (SWRCB) or the Regional Water Quality Control Board (RWQCB) when a project: 1) requires a federal license or permit (a Section 404 permit from the U.S. Army corps of Engineers is the most common federal permit for Caltrans projects), and 2) will result in a discharge to waters of the United States.

Section 402 of the Act establishes the National Pollutant Discharge Elimination System (NPDES) permit system for the discharge of any pollutant (except dredge or fill material) into waters of the United States. To ensure compliance with Clean Water Act Section 402 the SWRCB has issued a NPDES Statewide Storm Water Permit to regulate storm water discharges from Caltrans facilities both during and after construction, as well as from existing facilities and operations. The Statewide Storm Water Permit requires Caltrans to comply with the requirements of the General Construction Permit issued by the SWRCB to regulate discharges from construction activities which includes clearing, grading, disturbance to the ground, such as stockpiling or excavation, that results in soil disturbances of at least one acre of total land area. Construction activity that results in soil disturbances of less than

one acre is subject to the General Construction Permit if the construction activity is part of a larger common plan of development that encompasses one or more acres of soil disturbance or if there is significant water quality impairment resulting from the activity. The Statewide Storm Water Permit requires development of a Storm Water Pollution Prevention Plan (SWPPP) to address water pollution control. The SWPPP is prepared by the contractor and is subject to Caltrans' approval. The SWPPP identifies construction activities that may cause pollutants in storm water and the temporary best management practices (BMPs) that will be utilized to control these pollutants.

Additional laws regulating water quality include the Porter-Cologne Water Quality Act, Safe Drinking Water Act and Pollution Prevention Act. State water quality laws are codified in the California Water Code, Health and Safety Code, and Fish and Game Code Sections 5650-5656.

2.4.1. Impacts

The proposed project includes various earth disturbing activities that could affect water quality and storm water runoff. The primary constituent of concern is sediment both during and after construction. Another concern is the potential for spills and leaks of lubricants, oil, fuels, and other fluids associated with construction vehicles and equipment. Each of the build alternatives will have the potential to adversely affect water quality if not properly managed. Based on the least amount of ground disturbance, Alternative A1, the preferred alternative, will have the lowest potential of the build alternatives to adversely affect water quality. Potential water quality impacts associated with the "no-build" alternative include the following:

- Maintenance work on the bridge deck and steel truss superstructure would be required more frequently, thereby increasing work activities over Shasta Lake, which increases the inherent risks of equipment leaks and material spills.

- The existing lead paint on the bridge superstructure would remain in place. The potential for deterioration and deformation of the lead paint would remain unchanged.

- The potential for spills from traffic accidents on the existing narrower bridge and road alignment would remain unchanged.

Approximately 19 acres of land will be cleared of vegetation to accommodate the bridge replacement and highway realignment. Cuts and fills associated with the highway realignment will generate approximately 236,700 cubic yards of material.

Excess material will be used to restore the temporary construction staging areas and the sections of I-5 abandoned as a result of the highway realignment. Any excess material will be disposed of at an approved location within Caltrans right-of-way. Previously approved disposal sites are located adjacent to the northbound lanes of I-5, five miles north of the bridge at post mile 45.0 and adjacent to the southbound lanes between post miles 38.35 and 38.65.

Finish cuts on the new highway alignment will be 1:1.5 (vertical/horizontal) and fills will be from 1:4 to 1:6 depending on the surrounding topography. The highway storm water drainage system will need to be reconstructed where I-5 is modified or realigned. A preliminary estimate of the permanent impact to Army Corps jurisdictional waters is estimated to be approximately 0.042 acre or 1,245 linear feet of stream channel. The impact is limited to two small ephemeral streams in the vicinity of the proposed bridge's southern abutment. The channels of the two streams will be realigned to avoid scour near the bridge abutment and first bent (pier). Downstream of the bridge, the streams will converge into a single channel, previously occupied by one of the two streams, where it enters the lake. Drainage from the new bridge deck will discharge through scuppers directly into the lake. Rock slope protection will be placed on areas where erosion will be a factor due to the discharge from scuppers, such as near the bridge abutments.

Temporary easements will be obtained on STNF land and within Bureau of Reclamation jurisdiction for construction staging areas and lake access roads and ramps:

A. An area of approximately 8 acres with lake frontage is located near the northwest corner of the existing bridge. The upland area will be used for construction staging and storage of materials and equipment. An easement will be obtained on the lakeshore to provide the contractor with the option of constructing a temporary dock or ramp to gain access to the lake. A ramp would likely extend to the low water level. Construction of a ramp could require the importation of up to 119,000 cubic yards of rocky material. Suitable material will be available from excavations that will occur at Haycock Peak for the new highway alignment.

B. A smaller area of approximately 2.3 acres is available immediately east of the highway at the northern bridge abutment. This is the area where the northern abutment of the proposed bridge will be located. Consequently, extensive earthwork will occur at this location.

C. An easement is available for construction of a 30 foot wide temporary access road and ramp to access the lakebed immediately west of the Antlers boat

ramp parking lot and northerly of the boat ramp. The ramp would be situated so it does not interfere with operation of the public boat ramp. This area is a supplemental access point for construction. Following construction, the area will be restored to pre-existing conditions or as directed by STNF.

At locations A and C, temporary access roads or ramps may be constructed on the lakeshore and within the full pool elevation of the lake for construction access to the lake during low water levels. It is likely that these access ramps would be required on the east and west sides of the northern bridge abutment. Construction of the ramps would require excavation and placement of fill within the dry portions of the lakeshore. An access ramp on the west side (A) may require the importation of approximately 119,000 cubic yards of clean rock. Suitable material may be available from the excavations at Haycock Peak, which are required for the realignment of I-5. Otherwise, clean rock will be obtained from a commercial source. Ramps would be in place for the duration of construction and would become inundated as the lake level rises each year. It would be necessary for the contractor to construct the ramps to withstand the erosive forces of wave action and the fluctuating lake level. Following construction, the ramps would be removed.

Various types and sizes of piles may be installed temporarily for various reasons such as earth retaining structures, trestles, piers, coffer dams, moorings and anchorages, etc. Installation of piles will create temporary increases in turbidity as they are driven into the lakebed. Bridge piers will consist of large diameter piles. A bubble curtain will be used when driving large piles to reduce underwater pressure levels that can be harmful to aquatic life. The drafting effect created by the bubbles could cause turbidity or disperse turbid water depending on how close to the bottom the discharge of air occurs. After seating the large piles in the lakebed, an auger will be inserted in the steel shell to drill into the lakebed to the specified foundation depth. Dewatering of the shell may be necessary. The displaced drill cuttings will either be re-deposited on the lakebed through a flexible pipe or removed and disposed of at an appropriate upland disposal site. It is estimated that 3,000 to 7,300 cubic yards of spoils will be displaced by the twelve piles, ten of which are located within the full pool level of the lake. Removing the material from the lake and disposal at an upland site would require placing the material on barges, transporting to shore, removing the material and trucking to an upland disposal site, placement of the material within the disposal site. The cost of removing the material could be several hundred thousand dollars more than the cost of re-depositing the material on the lakebed. Re-depositing the material on the lakebed could result in considerable localized turbidity due to the fine consistency of the material.

Demolition of the existing bridge will include the removal of piers and abutments to an elevation of approximately one foot below original ground or lakebed elevation. The concrete piers are 10 feet thick, 40 feet wide, and approximately 150 feet in height. They contain hollow cells and substantial amounts of reinforcing steel. Removal would probably be accomplished by breaking the piers into smaller pieces using pneumatic or hydraulic impact hammers and/or explosives. The methods and timing of pier removal will depend upon water levels and available equipment. Demolition of the piers and abutments will result in approximately 4,063 cubic yards of concrete rubble, including reinforcing steel. Caltrans proposes to leave a portion of the PCC pier rubble on the lakebed to reduce the costs associated with retrieval and disposal of PCC waste. Reinforcing steel would be recovered and recycled or disposed of at an approved location. Abutments and piers located above the water level during demolition will be removed from the lake. Painted steel superstructure members that drop into the lake will be removed promptly and prior to subsequent demolition activities that could result in additional painted steel members entering the lake.

2.4.2. Avoidance, Minimization, and/or Mitigation Measures

The contractor is required to prepare a SWPPP, which will identify potential sources of pollution and temporary BMPs to protect water quality. In addition, the project includes permanent BMPs which are identified during the planning and design phase of the project. The following permanent BMPs are proposed to prevent sediment transport and introduction of solids and/or chemical constituents: hydro-seeding, placement of RSP on disturbed stream banks and/or lakebed where vegetation cannot be expected to become established, drainage and conveyance systems including asphalt dikes, over-side drains, flared culvert-end sections, outlet protection, and velocity dissipation devices.

Perennial streams that bisect proposed construction staging areas A and B near the northern bridge abutment will be designated as ESAs. The stream in area A also has a small adjacent wetland. The ESAs will be delineated with temporary fencing to prevent access and inadvertent impacts during construction.

Any steel portion of the bridge that enters the water, whether intentionally or accidentally, will be removed promptly and prior to beginning another operation.

The contractor is required to adhere to Caltrans' standard specifications and special provisions pertaining to water quality. The standard specifications pertaining to water quality include dust control, clearing and grubbing, earthwork, erosion control, and water pollution. In addition, the contractor is required to comply with the terms and conditions of regulatory permits issued by the California Department of Fish &

Game, the RWQCB, and the U.S. Army Corps of Engineers. Appropriate regulatory guidelines will be followed for any dewatering, and if required, siphoning operations within live streams and lake waters.

Implementation of the above mitigation measures and adherence to Caltrans' contract plans, specifications and special provisions, including regulatory permit conditions, will ensure that water quality impacts are reduced to a level below significance with respect to CEQA and NEPA guidelines.

The contractor will be required to prepare a spill containment plan for operations on the lake.

2.5. Hazardous Waste

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 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The purpose of CERCLA, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. RCRA provides for "cradle to grave" regulation of hazardous wastes. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety & Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

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 management of hazardous material is vital if it is disturbed during project construction

2.5.1. Impacts

An Initial Site Assessment (ISA) was conducted to determine if potential sources of hazardous waste exist within the project limits. The ISA entailed a review of hazardous waste databases, as-built plan sheets, and a field review of the project limits. It was determined that the project limits are not listed on the April 1998 State List of Hazardous Waste Sites, also referred to as the "Cortese List." The following potential hazardous waste issues were identified:

- Lead Containing Paint
- Asbestos Containing Materials

Lead Containing Paint

Traffic striping paint and/or thermoplastic striping present on the road surface may contain heavy metals including lead. When the paint or striping is removed exclusive of the asphalt concrete by grinding or abrasive blasting, the residue may contain high concentrations of heavy metals.

Lead was a common ingredient of paints manufactured before 1978 and is still an ingredient of some industrial paints. A Preliminary Site Investigation (PSI) identified lead containing paint on the bridge and lead contaminated soils beneath the bridge due to sandblasting. Lead levels found in the bridge paint exceed state and federal thresholds for classification as hazardous waste. The paint system on the bridge was noted to be intact. Lead levels found in the soil beneath the bridge exceed state thresholds for classification as California hazardous waste.

Asbestos Containing Material

Asbestos Containing Material (ACM) has been commonly used in bearing pads and joint filler material for bridge abutment and expansion joints. The PSI revealed no ACM on the bridge. However, not all areas of the bridge were accessible for sampling, and therefore, the PSI cannot conclusively report an absence of ACM.

2.5.2. Avoidance, Minimization, and/or Mitigation Measures

Lead Containing Paint

The contractor shall prepare a project specific lead compliance plan in accordance with Cal/OSHA regulations to protect workers who may be exposed to LCP and lead contaminated soils. In addition, the contractor is responsible for characterizing and segregating wastes prior to disposal.

Traffic striping paint and/or thermoplastic striping, removed from the road surface exclusive of the asphalt concrete by grinding or abrasive blasting, shall be sampled and analyzed for lead content and managed accordingly.

Soils excavated from beneath the existing bridge, extending to a depth of at least 24 inches, should be stockpiled separately and re-sampled to confirm total and soluble lead concentrations. Based on the sampling results, the soils should be managed, disposed of, or reused as appropriate.

Asbestos Containing Material

The U.S. Environmental Protection Agency's National Emissions Standards for Hazardous Air Pollutants (NESHAP) and the California Air Resources Control Board rules require written notification within ten working days prior to the commencement of any bridge demolition or renovation activity. If previously undetected ACM is discovered during construction, compliance with Cal/OSHA regulations pertaining to ACM must be followed.

2.6. Noise

Regulations pertaining to highway noise impacts to humans are found in the Code of Federal Regulations (23 CFR 772) and the California Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects.

A noise study was performed to assess potential increases in traffic noise levels that may result from the long-term operations of the proposed project. A separate bio-acoustic study was performed to assess potential noise levels that may result from proposed construction and demolition activities. The bio-acoustic study assesses airborne and underwater noise (pressure) levels.

2.6.1. Impacts

The primary source of ambient airborne noise in the project area is highway traffic on Interstate 5. Sensitive noise receptors within the project limits include the Antlers Campground, which is located approximately 0.26 mile northeast of the Antlers Bridge.

Table 2-1 gives a brief description of noise descriptors used in the noise studies.

Table 2-1 Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals and the reference pressure for water is 1 micro Pascal.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressure exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sounds are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A- and C-Weighted Sound Level, dBA and dBC	The sound pressure level in decibels as measured on a sound level meter using the A- or C-weighting filter network. The A-weighting filter de-emphasizes the low and high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. C-weighting only de-emphasizes sound levels at very low and very high frequencies (outside the normal human hearing range).
Equivalent Noise Level, Leq	The steady equivalent A-weighted noise level during the measurement period that results in the same acoustical energy as the time-varying level.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given

Term	Definitions
	location.
Peak Level	Peak sound pressure level based on the largest absolute value of the instantaneous sound pressure over the frequency range from 20 Hz to 20,000 Hz.
RMS (impulse) Level	The maximum root-mean-square (RMS) sound pressure level measured "over the duration of the pulse."
Sound Energy Level (SEL)	The noise exposure level of a single event measured over the time interval between the initial and final times for which the sound level of the single event exceeds the background noise level.

The peak-hour traffic noise level measured at the Antlers Campground is 56 dBA Leq(1hr). Based on predicted increases in traffic to the year 2030, it is estimated that noise levels will increase to 60 dBA Leq(1hr) at the Antlers Campground. Traffic noise receptors are considered impacted if estimated future noise levels increase by at least 12 dBA relative to existing conditions or if noise levels approach, within one decibel, or exceed 67 dBA. Based on the noise study, as presented in Table 2-2, no noise impacts are expected from the long-term operations of the project.

Table 2-2 Traffic Noise Impact Evaluation

Position	Location	Existing Noise	Design-Year Noise	Noise Impact
R1	Antlers Campground	56 dBA	60 dBA	None

Construction and demolition activities will result in temporary increases in both airborne noise levels and underwater pressure levels. Increases in airborne noise resulting from construction has the potential to affect the Antlers Campground and nesting raptors, such as the bald eagle and osprey, in the vicinity of the bridge. Increases in underwater pressure levels can potentially affect aquatic organisms in the vicinity of the bridge. The potential effects from noise upon fish and wildlife is discussed in Section 2.9.

Bridge and highway construction typically involves the use of heavy equipment including, but not limited to, excavators, scrapers, road graders, dump trucks, cranes, pile drivers, compressors, pavers, and concrete mixers. These types of equipment typically generate noise levels in the range of 70 to 100 dBA at a distance of 50 feet. Percussive pile driving often generates airborne peak noise levels well in excess of 100 dBA at 50 feet. The pile casings for the proposed bridge will be

approximately 13.1 feet in diameter, requiring one of the largest pile drivers in the industry. It is estimated that driving these large diameter pile casings will generate an airborne noise level of approximately 108 dBA at a distance of 330 feet. This translates to a noise level in the range of 92-95 dBA at the Antlers Campground, which is approximately 1,373 feet from the bridge.

An example of airborne traffic and construction related noise levels potentially generated near the existing bridge location are shown in Exhibit 7.

Table 2-3 Typical Airborne Sound Levels Measured in the Environment and Industry

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL dBA	COMMON INDOOR ACTIVITIES
	---110---	Rock Band
Jet Fly-over at 300 m (1000 ft)		
	---100---	
Gas Lawn Mower at 1 m (3 ft)		
	---90---	
Diesel Truck at 15 m (50 ft),		Food Blender at 1 m (3 ft)
at 80 km/hr (50 mph)	---80---	Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime		
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 in Next Room
Quiet Urban Nighttime	---40---	Theater, Large Conference
Quiet Suburban Nighttime		Room (Background)
	---30---	Library
Quiet Rural Nighttime		Bedroom at Night, Concert
	---20---	Hall (Background)
		Broadcast/Recording Studio
	---10---	
Lowest Threshold of Human Hearing	---0---	Lowest Threshold of Human Hearing

Source: Technical Noise Supplement, California Department of Transportation, 1998

Geologic studies indicate that excavations for the highway realignment at the south end of the bridge will require blasting due to rocky, non-rippable material. Blasting is expected to generate airborne noise levels of approximately 83 dBA at a distance of 500 feet.

2.6.2. Avoidance, Minimization, and/or Mitigation Measures

Airborne noise produced by construction equipment shall conform to Caltrans' Standard Specifications, Section 7-1.01I (Sound Control Requirements). The project will include the following special provision: The airborne noise level from the Contractor's operations, between the hours of 9:00 p.m. and 6:00 a.m., shall not exceed 86 dBA at a distance of 50 feet. The noise level requirement shall apply to equipment on the job or related to the job, including but not limited to trucks, transit mixers, or transient equipment that may or may not be owned by the Contractor. All internal combustion engines used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without a muffler. The

contractor shall also comply with all local sound control and noise level rules, regulations, and ordinances.

A special provision will be included in the construction contract to control the effects of blasting. The special provisions will control airborne noise, vibration and fly rock associated with blasting. If explosives are used to demolish bridge piers, a bubble curtain shall be used below the water line. In addition, other measures, including but not limited to the following, must be implemented if feasible to further reduce underwater pressure levels: use of blast suppression blankets, bore hole stemming, and charge delays.

2.7. Air Quality

The project is located within the Sacramento Valley Air Basin within the jurisdiction of the Shasta County Air Pollution Control District. Emissions and ambient air quality are the two standards by which air pollution is regulated. If there is at least one violation of a State standard, the area is designated "non-attainment" for that pollutant. If a State standard is not violated within a three year period, the area is considered "attainment." A pollutant is designated "unclassified" if the data are incomplete and do not support a designation of attainment or non-attainment. Shasta County is currently in attainment or unclassified for listed State and Federal pollutants except for the State standard for ozone and suspended particulate matter less than 10 microns in diameter (PM10) [California Air Resources Board, 2001]. Federal PM 2.5 conformity, including hot spot analysis, requirements do not apply to this geographical area.

2.7.1. Impacts

Bridge demolition and construction activities will result in temporary increases in airborne pollution. Pollution sources include the combustion engines of construction equipment, earth disturbance, and dust resulting from the demolition of the existing concrete bridge.

The new bridge will require substantial amounts of Portland Cement Concrete (PCC). Asphalt concrete (AC) will also be required for roadway improvements. For economic and scheduling purposes, the contractor may choose to establish a temporary PCC and/or AC batch plant on-site. It will be the contractor's responsibility to obtain an operating permit from the Shasta County Air Resources Board, which may require additional environmental studies to comply with CEQA. The contractor will be responsible for satisfying the need for additional studies if required. Studies needed for an operating permit may include air quality, noise

levels, traffic, and possibly other environmental factors. An environmental evaluation for a batch plant(s) was not performed for this project because the project does not require an on-site batch plant, therefore, pertinent information is not known, such as plant type, size, location, period of operation, etc.

2.7.2. Avoidance, Minimization, and/or Mitigation Measures

The Environmental Protection Agency's (EPA) National Emissions Standards for Hazardous Air Pollutants (NESHAP) and the California Air Resources Board (CARB) rules require the contractor to notify the CARB in writing prior to demolition or renovation of the existing bridge. Caltrans will implement mitigation measures required by the EPA and CARB. In addition, water will be used to suppress dust during construction activities and pavement will be swept and wet down as necessary to prevent tracking.

2.8. Vegetation

On February 3, 1999, President 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, this 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 NEPA analysis for a proposed project.

The project area is situated 1,040 feet above sea level and has a Mediterranean climate with cool moist winters and warm dry summers. The average January temperature is 44° F; the average July temperature is 81° F. Roughly 80 percent of the total precipitation, which averages 70 inches annually, falls in the six-month period between November and April (USDA 1980). The predominant natural plant communities are mixed conifer series, Douglas fir-ponderosa pine series, and ponderosa pine series. Mixed chaparral communities occur on south-facing slopes at lower elevations. Canyon live oak series is common on steep rocky slopes with stony soils (USDA 1997). The project area is dominated by a sparse overstory of ponderosa pine, gray pine, Douglas fir, knobcone pine, black oak, and canyon live oak. The chaparral and forest understory is dominated by several species of ceanothus, white-leaf manzanita, poison oak, snowdrop bush, Himalayan blackberries, and wild grape. This habitat ranges in age between 30-80 years old

and is typified as early to mid-mature seral habitat. Late successional and old growth forest are not present (USDA 2005).

A federally listed noxious weed, Rush skeleton weed (*Chondrilla juncea*), is present within and adjacent to the highway corridor in the vicinity of the Antlers Bridge. The Shasta County Department of Agriculture (County), in a cooperative agreement with Caltrans, conducts a weed management program on the State highway system. Weed management within the project limits includes herbicide treatment and hand-pulling. Hand-pulling the weed prevents the formation of seed heads. However, it does not always kill the plant due to its vigorous root system. Herbicides include clopyralid (Transline), glyphosate (Round-up), and chlorsulfuron. STNF has been experimenting with various methods of mechanical weed control on an affected area adjacent to the highway near the south abutment of Antlers Bridge. The Rush skeleton weed population is confined to an area of approximately three acres in the vicinity of the bridge. Another noxious weed, Scotch broom (*Cytisus scoparius*), is located within the proposed construction staging area west of the northern bridge abutment.

2.8.1. Impacts

Approximately 19 acres of land will be cleared of vegetation and graded to accommodate the proposed new bridge and highway alignment. Additional areas in the vicinity of the bridge will be available for the contractor's optional use as temporary construction access and staging areas. If utilized, these sites will be cleared of vegetation and graded. The proposed temporary access and staging areas include:

- An 8 acre lakefront site located west of the north abutment of the Antlers Bridge.
- A 2.3 acre site immediately east of the northern bridge abutment. This is the footprint of the northern abutment and adjoining section of highway for the proposed bridge.
- An area adjacent to the Antlers public boat ramp. An easement is available for a 30 foot wide access road and boat ramp, and an area of approximately one acre for staging.
- The wide area adjacent to the traveled way, within the highway right-of-way, at the south end of the bridge.

2.8.2. Avoidance, Minimization, and/or Mitigation Measures

Abandoned sections of highway resulting from the highway realignment will be obliterated and restored to blend with the surrounding topography to the extent practicable. Native woody vegetation will be planted in these areas.

The staging areas located on the west and east sides of the highway adjacent to the northern bridge abutment are both bisected by streams. The streams and the associated riparian corridors or upland buffers will be designated as ESAs and delineated with temporary fencing. In addition, selected mature upland trees located around the perimeter of the northern staging areas will be preserved to the extent practicable, i.e., to the extent the trees do not interfere with construction operations. Following construction, all equipment and construction debris will be removed from the site. The staging and access areas will be ripped, graded and planted with native woody vegetation. Upland coniferous forest will be replanted in disturbed areas beyond the clear recovery area of the new section of highway. The clear recovery area extends 30 feet from the edge of the traveled way. Special provisions will be included in the project to salvage and stockpile select material (topsoil) during grading. This material will be used to dress areas that will be revegetated. A stockpile area for duff will be designated on the plan sheets.

Caltrans will enter into an agreement with STNF and the Shasta County Department of Agriculture (County) to expand efforts to eradicate Rush skeleton weed on and adjacent to I-5 in the project vicinity. Included in the treatment area is approximately 3.7 acres of STNF land adjacent to I-5 near the southern bridge abutment. This area has a substantial population of Rush skeleton weed and therefore will be designated as an ESA to prohibit access and disturbance during construction. The County will hand pull weeds and apply herbicides prior to, during, and following construction. Monitoring and treatment will occur for a period of two years following construction to ensure containment and eradication of the weed.

Designated locations for temporary stockpile and permanent placement or disposal of excavated materials will be designated in the contract plans to facilitate monitoring and treatment of Rush skeleton weed. In addition, equipment entering and leaving the construction site shall be washed to prevent the import and export of noxious weed seeds.

2.9. Fish and Wildlife

Shasta Lake supports cold water and warm water fisheries including, but not limited to, trout, salmon, bass, crappie, sunfish, sturgeon, and catfish. Coldwater species

such as trout and salmon are largely maintained by the California Department of Fish and Game through annual stocking.

Shasta Lake has a large population of bald eagles and osprey. There are currently active bald eagle and osprey nests in the vicinity of the bridge. An osprey nest is adjacent to the proposed construction staging area northwest of the bridge. A bald eagle nest is located within the Gregory Creek Campground, approximately 0.75 mile from the bridge site. Since the nest was discovered in 2003, the pair has produced two chicks each year. The bald eagle is a federally listed threatened species and is protected under Section 7 of the Federal Endangered Species Act. Caltrans prepared a Biological Evaluation to comply with Section 7 of the Federal Endangered Species Act. The U.S. Fish & Wildlife Service issued a letter of concurrence on November 9, 2005 to address Caltrans' determination of "not likely to adversely affect" the bald eagle.

Two species of bats utilize the interior cells of the concrete bridge piers for temporary night roosting. The bats gain entry to the piers through weep holes. Bat use was verified by daytime inspections, which revealed an absence of bats but substantial accumulations of guano within the piers.

Cliff swallows routinely attach nests to the bridge. Nests are constructed of mud and are usually located along the outside edge of the concrete bridge deck where acute angles are formed. Nesting typically occurs March through July.

Various types of small and large mammals cross Interstate 5 south of the Antlers Bridge to forage and obtain water. This section of Interstate 5 bisects a deer migration route. Consequently there is a high occurrence of deer versus vehicle incidents.

2.9.1. Impacts

The project will require pile driving to install various types and sizes of piles. Depending on the size and type of pile and the method of installation, pile driving can generate airborne noise that could disrupt nesting and foraging activities of adult and juvenile bald eagles and osprey, and underwater noise pressure levels that can kill or injure aquatic organisms.

Percussive pile driving often generates airborne peak noise levels well in excess of 100 dBA. It is estimated that pile drivers installing large (13.1 foot diameter) steel pile casings will generate airborne noise levels in the range of 108 dBA at a distance of approximately 330 feet, while noise levels at the eagle's and osprey's nests may reach 82-98 dBA (see Table 2-4).

Table 2-4 Maximum Sound Pressure Levels Resulting from Pile Driving

Condition	Predicted Sound Pressure Level	
	Eagle Nesting Area	Osprey Nesting Area
CISS Foundation Pile Driving – Pier 2	82-87 dBA	87-92 dBA
CISS Foundation Pile Driving – Pier 3	83-88 dBA	89-94 dBA
CISS Foundation Pile Driving – Pier 4	83-88 dBA	92-97 dBA
CISS Foundation Pile Driving – Pier 5	83-88 dBA	93-98 dBA

Underwater noise pressure travels more efficiently through denser materials such as rock and soil, compared to water or air. Therefore, even pile driving on the dry lakeshore can transmit noise and pressure that can potentially affect aquatic life. Table 2-5 provides definitions for underwater acoustical terms used in this report.

Table 2-5 Definitions of Underwater Acoustical Terms

TERM	DEFINITIONS
Peak Sound Pressure, unweighted (dB)	Peak sound pressure level based on the largest absolute value of the instantaneous sound pressure. This pressure is expressed in this report as a decibel (referenced to a pressure of 1 µPa) but can also be expressed in units of pressure, such as µPa or PSI.
RMS Sound Pressure Level, dB re 1 µPa	The average of the squared pressures over the time that comprise that portion of the waveform containing 90 percent of the sound energy for one pile driving impulse[2].
Total Acoustic Energy, dB re 1 μPa^2 sec	Proportionally equivalent to the time integral of the pressure squared and is described in this report in terms of μPa^2 sec over the duration of the impulse. Similar to the unweighted Sound Exposure Level (SEL) standardized in airborne acoustics to study noise from single events.
Waveforms, µPa over time	A graphical plot illustrating the time history of positive and negative sound pressure of individual pile strikes shown as a plot of µPa over time (i.e., seconds)
Frequency Spectra, dB over frequency range	A graphical plot illustrating the distribution of sound pressure vs. frequency for a waveform, dimension in rms pressure and defined frequency bandwidth

[2] The underwater sound measurement results obtained during the Pile Installation Demonstration Project indicated that most pile driving impulses occurred over a 50 to 100 millisecond (msec) period. Most of the energy was contained in the first 30 to 50 msec. Analysis of that underwater acoustic data for various pile strikes at various distances demonstrated that the acoustic signal measured using the standard "impulse exponential-time-weighting" (35-msec rise time) correlated to the RMS (impulse) level measured over the duration of the impulse.

The most recent data indicates that injury and/or mortality may occur when underwater peak sound pressure levels exceed 208 dB re 1 µ Pa and a sound energy level (SEL) of 187 dB re 1 µ Pa^2-sec at a distance of 33 feet from the pile.

Specific underwater pressure levels expected during the Antlers Bridge replacement project cannot be accurately predicted due to varying factors such as size and type of pile, size of pile driving hammer, resistance of substrate and water depth. Based on data from similar bridge projects, the estimated underwater pressure levels at Antlers Bridge, expressed as both Peak and SEL are shown in Table 2-6.

Table 2-6 Estimated Underwater Pressure Levels at Antlers Bridge

Distance	Peak	RMS	SEL
10 meters	220	185	194
20 meters	215	203	190
50 meters	210	196	184

Demolition of the existing bridge may result in airborne and underwater noise and pressure impacts. It is unknown what method of demolition the contractor will use to remove the existing bridge. Blasting of the piers and superstructure are viable options for the contractor to consider. Uncontrolled underwater blasting is estimated to generate pressures of 190-220 dB Peak or 170-175 dB SEL.

Demolition of the existing bridge will eliminate an existing roosting and nesting structure for bats and swallows respectively.

2.9.2. Avoidance, Minimization, and/or Mitigation Measures

To avoid and minimize the effects of construction on the bald eagle and osprey, the following measures will be implemented:

- If percussive driving of large diameter piles and demolition blasting methods are used, they will be prohibited during the period of January 15 to August 15 to avoid nesting, rearing and foraging activities.
- Continuous, routine construction activities at the proposed northwest construction staging area must begin between August 15 and December 1. This will acclimate the birds to construction activities prior to nesting. A Caltrans biologist will monitor the osprey nest during construction.
- Tree removal throughout the project limits will be limited to the period of August 15 to December 31 to avoid impacting bald eagles and migratory

birds. No potential nest or perch trees will be removed for the highway alignment.

- An ESA fence will be installed along the western border of the 8 acre staging area to prevent access to the osprey nesting area.

- Funding in the amount of $71,500 will be provided to STNF to conduct the following activities relative to the bald eagle: 1) monitor the nest at Gregory Creek Campground during the three year construction period. 2) construct a nesting platform easterly of the existing nest to encourage the eagles to occupy a site outside of the campground, and 3) to enhance feeding opportunities for the eagle during construction, live fish will be placed in an open-top trap within the eagle's usual foraging area.

A bubble curtain will be required to attenuate underwater pressure levels when large diameter piles are driven with a percussive hammer. Based on the project design and environmental conditions at the project site, use of a bubble curtain is the best available technology to attenuate underwater noise pressure. A bubble curtain consists of a cylindrical arrangement of hollow pipes, either steel or plastic, with small holes through which air is pumped. The pipe assembly is placed around the pile. Powered by a large compressor, the bubbles create an air curtain. The pressure waves decrease in intensity as they travel through the air bubble curtain, which is less dense then the surrounding water and therefore does not convey the pressure waves as efficiently. It is anticipated that the bubble curtain will result in a reduction of 10-20 dB within a distance of 330 feet of the piles.

If explosives are used to demolish bridge piers below the water line, a bubble curtain shall be used. Measures to reduce underwater pressure levels resulting from blasting include, but are not limited to, use of blast suppression blankets, bore hole stemming, and charge delays.

Even thought the best available technology will be utilized to protect fisheries in Shasta Lake, impacts may not be fully avoided or minimized to an acceptable level. To offset these impacts, Caltrans will provide funds to the California Department of Fish and Game to be used to improve angling opportunities in the lake by repopulating game fish species.

To avoid impacts to bats that roost within the bridge piers, all points of entry into the piers will be blocked when the bats are not present prior to bridge demolition. A bat roosting "slot" will be incorporated into the new concrete bridge to provide permanent bat habitat. Monitoring surveys will be conducted for two seasons following

construction to determine if bats are utilizing the new structure, and if so, the number and species of bats.

If bridge demolition work cannot be scheduled to occur between the months of August 1 and March 1 when swallows are not nesting, an exclusionary device such as netting will be installed to prevent nest construction on the bridge. Prior to the installation of an exclusionary device, existing, unoccupied nests will be knocked down to discourage the birds from trying to occupy them

To minimize animal crossing conflicts on I-5, deer proof fencing will be installed on both sides of I-5 from the south abutment of the new bridge to a point approximately 0.5 mile south. A bench will be constructed under the south abutment to provide a safe passage across the highway. One-way deer gates will be installed at strategic locations to provide an exit should the deer enter the fenced portion of the highway.

2.10. Cumulative Impacts

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines, Section 15130 describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts, under NEPA, can be found in 40 CFR, Section 1508.7 of the CEQ Regulations.

Projects planned or recently constructed in the vicinity of the Antlers Bridge that may affect water quality are discussed below:

The U.S. Department of the Interior, Bureau of Reclamation (Mid-Pacific Region), is studying alternatives to increase the capacity of Shasta Lake. The purpose of this project is to improve anadromous[3] fish survival and water supply reliability, habitat restoration, flood control, and to meet the growing demand for new energy sources. Five initial alternatives were developed that include raising the dam between 6.5 and 18.5 feet. The schedule for developing this project is as follows: the environmental scoping process was initiated in spring 2005; prepare draft EIR/EIS in winter 2007; prepare final EIR/EIS and approve project in fall 2008; project construction 2010 to 2015.

Caltrans implemented an emergency project in spring 2004 to replace the concrete deck on the Antlers Bridge due to severe, premature deterioration. The main cause for the accelerated deterioration of the deck was high truck traffic volumes. The deck replacement project was completed in fall 2004.

STNF, in conjunction with Seven Crown Resorts, proposes construction of a new marina at Turntable Bay to replace the existing Digger Bay Marina. The new marina would include increased public boat moorage, a four-lane boat launching ramp, boat rentals, paved parking areas, and picnic tables and trails. STNF published a Notice of Intent to prepare an Environmental Impact Statement, as required by the National Environmental Policy Act, on July 6, 2005.

In spring 2006, Caltrans began a roadway rehabilitation project on Interstate 5 from the Antlers Bridge to one mile south of the Dog Creek Bridge. The project entails reconstruction of the paved roadway, drainage improvements, and the removal of trees within 30 feet of the traveled way to create a “clear recovery” area for errant vehicles. It is anticipated that the project will be completed by spring of 2007.

The National Pollutant Discharge Elimination System, administered by the California Regional Water Quality Control Boards, regulates direct and indirect discharges to surface and ground waters. Due to the requirement to control discharges from construction sites, including storm water discharges, it is reasonable to say that the projects referenced above will not result in a cumulatively considerable effect upon water quality. Additional information regarding water quality regulations, potential impacts and mitigation measures related to the proposed bridge replacement project are included in Chapter 2 “Water Quality and Storm water Runoff.”

[3] Fish that migrate from salt water to fresh water or up rivers to spawn, e.g., salmon, shad, etc.

Chapter 3. Consultation and Coordination

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential impacts and mitigation measures, and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including project development team meetings, interagency coordination meetings, and public information meetings. This chapter addresses Caltrans' efforts to fully identify, address, and resolve project related issues through early and continuing coordination.

A Notice of Initiation of Studies was published in the Record Searchlight on August 27, 2000 and September 10, 2000 to inform the public that Caltrans was in the early planning process and information was available concerning the development and evaluation of project alternatives. The public was encouraged to inquire and comment on the proposal. The notice indicated that a public information meeting would be conducted if enough interest in the project were generated. There are no responses to the public notice on record.

On December 17, 2003, the Caltrans Project Manager was invited by the Lakehead Community Development Association to make a brief presentation during one of their meetings at a local restaurant. A presentation was made to the Association, which is comprised of about 11 members, regarding project alternatives and project schedule.

A notice was published in the Record Searchlight on January 7, 2004, advertising an open-house format public information meeting. Notices were mailed directly to appropriate public agencies, interest groups, and interested parties. The meeting was held on January 20, 2004 at the Lakehead Lions Club Building. Project information presented at the meeting included the project purpose and need (problem) statement, alternative alignments for the bridge replacement, potential project related impacts, project schedule, and an outline of the project development process. Approximately 41 people attended the meeting, including local residents, local business owners, and representatives from the Shasta-Trinity National Forest and the Bureau of Reclamation. Eleven comments were received as a result of the public information meeting. It was determined that one comment warranted a written response. The comments and Caltrans' response to comment number 11 are included in Appendix C.

A Value Analysis was conducted in May 2004. Value Analysis is defined by Caltrans as "the process used to improve the quality and reduce the cost of transportation

projects and other Caltrans programs." Alternative A1 was developed during the Value Analysis process.

Agencies contacted during the project planning stage include:

U.S. Department of Agriculture, Shasta-Trinity National Forest, Shasta Lake Ranger District

U.S. Department of the Interior, Bureau of Reclamation

United States Army Corps of Engineers, Regulatory Branch

U.S. Environmental Protection Agency, Water Quality Unit

California Department of Fish and Game, Region 1

Regional Water Quality Control Board, Central Valley Region

U.S. Fish and Wildlife Service

Shasta County Department of Agriculture

State Office of Historic Preservation

Native American Heritage Commission

Redding Rancheria

Wintu Education and Cultural Council

Central Valley Wintu Toyon Center/Keswick Rancheria

Chapter 4. List of Preparers

This Initial Study was prepared by the California Department of Transportation, North Region Office of Environmental Management in Redding, within input from the following Staff:

ARTURO CEBALLOS, Transportation Engineer. Contribution: Roadway design.

TIM ELLISON, Associate Landscape Architect. Contribution: Soil stabilization, contour grading and site restoration.

TOM GRAVES, Associate Engineering Geologist. Contribution: Hazardous waste site assessment.

ROXANNE HAATVEDT, Associate Environmental Planner (Generalist). Contribution: Visual Impact Analysis.

ILLINGWORTH & RODKIN, Inc. Contribution: Bio-acoustic Noise study.

JASON LYNCH, Senior Bridge Engineer, Contribution: Bridge design.

DAN MCGANN, Associate Environmental Planner (Archaeology). Contribution: Archaeological studies and coordination.

CANDACE MILLER, Associate Environmental Planner (Natural Sciences). Contribution: Biological studies and coordination.

CHRIS QUINEY, Associate Environmental Planner (Generalist). Contribution: Environmental coordination and document writer.

TED SCHULTZ, Transportation Engineer. Contribution: Storm water Coordination and Water Quality Assessment Report.

BENJAMIN TAM, Transportation Engineer. Contribution: Project level noise analysis.

Chapter 5. References

California Air Resources Board. Area Designation Maps / State and National. Updated May 13, 2002. (http://www.arb.ca.gov/desig/adm/adm.htm).

California Department of Transportation. Standard Specifications. 1999.

California Department of Transportation. Technical Noise Supplement. 1998

Central Valley Regional Water Qualify Control Board. Water Quality Control Plan for the Sacramento River and San Joaquin River Basins. 3rd Edition, 1994.

Department of the Interior, Bureau of Reclamation, Mid-Pacific Region. The Shasta Lake Water Resources Investigation. August 2004.

Illingworth & Rodkin, Inc. March 23, 2006. Analysis of Potential Airborne and Underwater Construction Noise for the Antlers Bridge Replacement Project, California Department of Transportation.

Popper, A.N., Carlson, T.J., Hawkins, A.D., Southall, B.L., Gentry, R.L. May 2006. Interim Criteria for Injury of Fish Exposed to Pile Driving Operations: A White Paper

Exhibit 1 Project Vicinity Map

Caltrans	State of California Department of Transportation	Proposed Antlers Bridge replacement on Interstate 5 in Shasta County near Lakehead
	SHA-5-PM R39.0/R41.2 378900	

Exhibit 2 Project Location Map

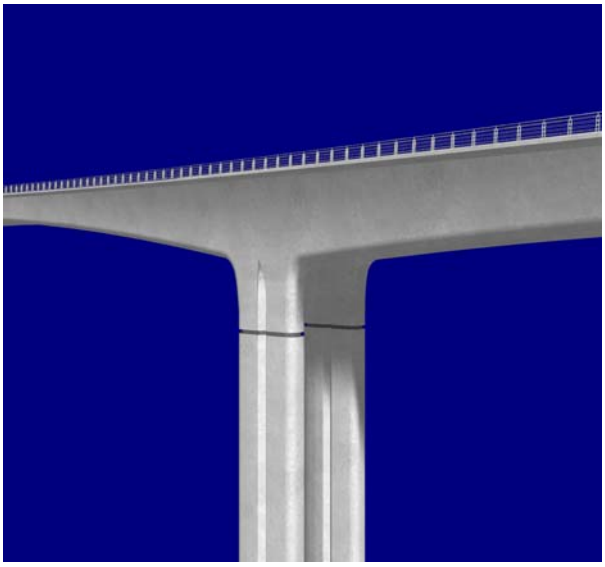
Caltrans	State of California Department of Transportation	Base map: Lamoine Township 35N, Range 5W, Sections 13 & 24
	SHA-5-PM R39.0/R41.2 02-378900	

Exhibit 3 Environmental Study Limits

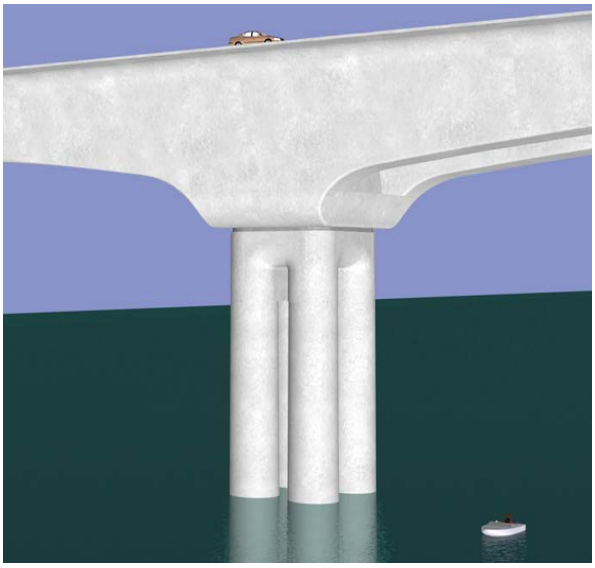
Exhibit 4 Proposed Bridge Designs Under Consideration

Exhibit 5 Alternative Highway Alignments

Exhibit 6 Bridge Pier Options Under Consideration

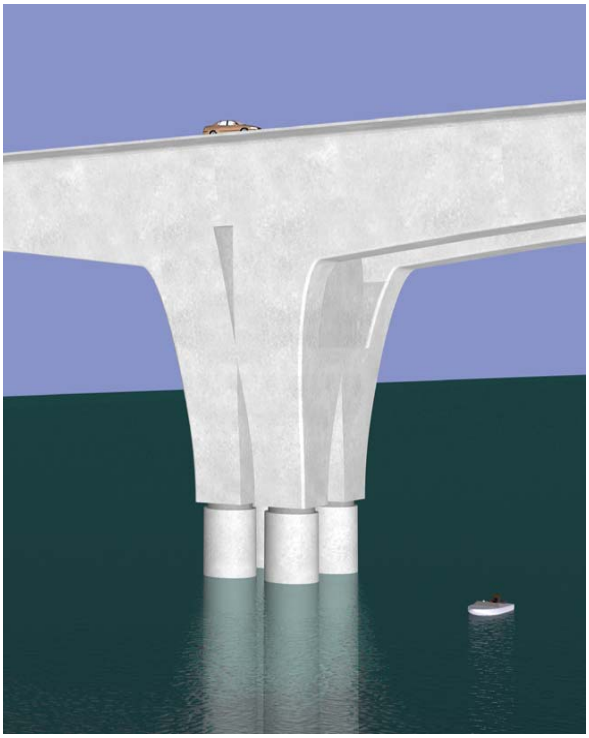


Shrouded Piles



Rounded Pile Cap/Soffit

Steel Shells Left on Piles (Rusted)



Non-Rounded, Extended Pile Cap/Soffit

Exhibit 7 Estimated Traffic and Construction Noise Levels

Appendix A California Environmental Quality Act Evaluation

1.1 Determining significance under CEQA

The proposed project is a joint project by Caltrans and the FHWA and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared to comply with both CEQA and NEPA. Caltrans is the lead agency for CEQA compliance and the FHWA is the NEPA lead agency.

One of the primary differences between CEQA and NEPA is the way significance is determined. Under NEPA, significance is used to determine whether an EIS, or some lower level of documentation will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) *as a whole* has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, 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 may have a significant effect on any environmental resource, then an EIR must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA. This chapter discusses the effects of this project and CEQA significance.

1.2 CEQA Environmental Checklist

The following checklist identifies physical, biological, social, and economic factors that might be affected by the proposed project. The CEQA impact levels include potentially significant impact, less than significant impact with mitigation, less than significant impact, and no impact. Please refer to the following for detailed discussions regarding impacts:

CEQA:

- Guidance: Title 14, Chapter 3, California Code of Regulations, Sections 15000 et seq. (http://www.ceres.ca.gov/topic/env_law/ceqa/guidelines/)
- Statutes: Division 13, California Public Resource Code, Sections 21000-21178.1 (http://www.ceres.ca.gov/topic/env_law/ceqa/stat/)

CEQA requires that environmental documents determine significant or potentially significant impacts. In many cases, background studies performed in connection with the project indicate no impacts. A “no impact” reflects this determination. Any needed discussion is included in the section following the checklist.

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
AESTHETICS - Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	X	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	X	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	X
AGRICULTURE 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. 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?	☐	☐	☐	X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	X
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	X
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?	☐	☐	☐	X
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	X

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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)?	☐	☐	☐	X
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	X
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	X
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?	☐	X	☐	☐
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?	☐	☐	☐	X
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?	☐	☐	☐	X
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?	☐	☐	X	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	X	☐
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?	☐	☐	☐	X

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
COMMUNITY RESOURCES - Would the project:				
a) Cause disruption of orderly planned development?				X
b) Be inconsistent with a Coastal Zone Management Plan?				X
c) Affect life-styles, or neighborhood character or stability?				X
d) Physically divide an established community?				X
e) Affect minority, low-income, elderly, disabled, transit-dependent, or other specific interest group?				X
f) Affect employment, industry, or commerce, or require the displacement of businesses or farms?				X
g) Affect property values or the local tax base?				X
h) Affect any community facilities (including medical, educational, scientific, or religious institutions, ceremonial sites or sacred shrines?				X
i) Result in alterations to waterborne, rail, or air traffic?				X
j) Support large commercial or residential development?				X
k) Affect wild or scenic rivers or natural landmarks?				X
l) Result in substantial impacts associated with construction activities (e.g., noise, dust, temporary drainage, traffic detours and temporary access, etc.)?			X	
CULTURAL RESOURCES - Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?				X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?				X
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X
d) Disturb any human remains, including those interred outside of formal cemeteries?				X

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
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?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
HYDROLOGY AND WATER QUALITY - Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	X	☐
f) Otherwise substantially degrade water quality?	☐	☐	☐	X
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?	☐	☐	☐	X
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	X
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?	☐	☐	☐	X
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	X
LAND USE AND PLANNING - Would the project:				
a) 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, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	X
b) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	X
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?	☐	☐	☐	X
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?	☐	☐	☐	X
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	☐	☐	☐	X

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
agencies?				
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	X
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	X
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	X
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?	☐	☐	☐	X
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?	☐	☐	☐	X
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)?	☐	☐	☐	X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	X
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:				
Fire protection?	☐	☐	☐	X
Police protection?	☐	☐	☐	X

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
Schools?	☐	☐	☐	X
Parks?	☐	☐	☐	X
Other public facilities?	☐	☐	☐	X

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?	☐	☐	☐	X
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?	☐	☐	☐	X

TRANSPORTATION/TRAFFIC - Would the project:

a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☐	X
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	X
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?	☐	☐	☐	X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	X
e) Result in inadequate emergency access?	☐	☐	☐	X
f) Result in inadequate parking capacity?	☐	☐	☐	X
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	X

	CEQA			
	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
UTILITIES AND SERVICE SYSTEMS - Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	X
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?	☐	☐	☐	X
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?	☐	☐	☐	X
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	X
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?	☐	☐	☐	X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	X
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	X

CEQA			
Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact

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, 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?	☐	☐	☐	X
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)?	☐	☐	☐	X
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	X

Appendix B Resources 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.

The following three properties are located within or adjacent to the project area:

1. The Antlers public boat ramp is administered by STNF and is located immediately northeast of the Antlers Bridge. STNF considers the boat ramp an important facility because it is the only public ramp of its kind in the vicinity and access to the lake is generally limited due to steep terrain. The boat ramp is approximately 60 feet wide (4-lanes) and is accessible until the lake level is drawn down 75 feet from full pool elevation. The boat ramp facility has paved parking, an information kiosk, vault toilets, a picnic area, and a wheelchair accessible boat loading platform. This facility is adjacent to the Antlers Campground and amphitheater. The Sugarloaf ramp is also located on the Sacramento River arm of the lake, but is used only when the Antlers ramp is closed at the 75 foot drawdown level.

2. The Antlers public campground is also administered by STNF and abuts the east side of the boat ramp parking lot. An amphitheater is located between the campground and boat ramp for interpretive programs offered by STNF during summer months. The campground is considered an “important” facility by STNF because of its strategic location on the lakeshore next to a boat ramp and within close proximity to Interstate 5 and the community of Lakehead. The campground has 41 single sites and 18 double sites, paved access road and parking spurs, water, flush/vault toilets, accommodates trailers to 30 feet in length, and is open all year.

3. A cultural site is located within the full pool level of Shasta Lake. The site is submerged except during drought periods. Because the resource is seldom exposed, it was not possible to evaluate the site for eligibility to the National Register of Historic Places. For the purposes of the proposed project, the site was assumed eligible for the National Register of Historic Places. It is

also assumed that the site has value for preservation in place and therefore is subject to treatment as a Section 4(f) resource.

The Antlers boat ramp is not available for use by the contractor for purposes related to the bridge replacement project unless such use is performed in strict accordance with the rules applicable to the general public. Easements have been obtained for the contractor to utilize areas adjacent to each side of the northern bridge abutment for construction staging, stockpiling, and lake access. The contractor's use of the staging, stockpiling and access areas shall not interfere with the public's access to or use of the boat ramp, including navigation beyond the toe of the ramp. A vegetative buffer will be left in place if the contractor utilizes the area abutting the west end of the boat ramp parking lot. Access will be gained from the county road. Certain activities, if necessary, such as the use of explosives and maneuvering extra-large equipment, may cause intermittent disruptions of vehicle, boat, and pedestrian traffic, including activities at the boat ramp. These circumstances are not predictable at this stage of project development, but are realistic expectations given the scope of the project.

No portion of the Antlers Campground will be accessed or directly impacted by construction activities, nor will the campground be available for project related lodging of construction employees. Access to the campground will not be impaired by construction activities. Noise from the contractors operations between the hours of 9:00 p.m. and 6:00 a.m. will be limited to a maximum of 86 decibels at a distance of 50 feet.

The proposed project will not cause a constructive use of the Antlers public boat ramp or the Antlers campground because the proximity impacts will not substantially impair the protected activities, features, or attributes of these properties.

The cultural site will be designated as an ESA in the project special provisions and plan sheets. An ESA action plan has been developed. The ESA will be delineated with buoys during high water levels. Should the site become exposed due to lower than normal water levels, stakes or fencing will be used to delineate the ESA boundary. No work will be permitted within the ESA and therefore there is no "use" and the provisions of Section 4(f) are not triggered.

Appendix C Scoping Comments

1) "I like plan "B" better because it is straighter & less likely to have accidents between cars & trucks, especially during inclement weather. We average about 60 inches of rain a year, usually in 3 months, and we sometimes get snow & ice, so the straighter, the better. Also, I think it should be 3 lanes in each direction from the start. The traffic just gets heavier every year, & I believe it is short sighted to now make it 6 lanes from the start of planning."

2) "Use left-over sand to make some sand beaches! Also keep the "old" bridge as a walk/bike bridge – good for the tourists."

3) "Use area of circle southeast of bridge for staging area. Design temporary boat ramp for future sue by public after new bridge is complete. Alternative B looks like a much safer route for trucks, etc. by taking out the downhill curves."

4) "My husband a retired truck driver believes the red alternative, plan B, would be safer for trucks. Pipe dream – leave the old bridge for hiking, biking, walking!!"

5) "Thank you for holding the Antlers Bridge replacement project open house this evening in Lakehead. I learned much and I look forward to being kept informed as we proceed with this project. I prefer Alternative B. I suggest you hold an additional meeting in Redding. I believe you would get not only additional input, but also many more perspectives."

6) "I like plan B for the Lakehead Bridge reconstruction project. It seems to be the safest proposal. I also agree with having 3 lanes going south to accommodate slow moving semi trucks climbing the steep grade. Also, leaving the old bridge would be great for hiking, biking, picnicking and perhaps bungee jumping, as well as some great photography."

7) " Suggest low level lighting on the bridge. Reasons: 1) Drive - safety to spot stalled vehicles or road debris in the lane from a distance enabling them to safely slow down and react. 2) For emergency personnel – to light up the lanes when at a traffic accident on the bridge. Lights could be solar powered or use existing electrical on the bridge."

8) "Make 1 lane a truck lane only – no 4 wheelers. Also it would help if the truck lane was longer on the up hill grade."

9) "Plan B looks the best."

10) “There is a significant bump at the northbound bridge approach.”

11) “What will be done with the existing bridge? Is there a plan to incorporate pedestrians or cycling in a safer situation? Will the elevation of the bridge compensate for anticipated changes, such as future plans to raise the dam? Will there be any type of lighting? (Caltrans’ response to these questions follow on next page.)

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING ARNOLD SCHWARZENEGGER, *Governor*

DEPARTMENT OF TRANSPORTATION
P.O. Box 496073
Redding, CA 96049-6073
TTY Telephone (530)225-2019
FAX (530)225-3019
TELEPHONE (530) 225-3308

Flex your power!
Be energy efficient!

February 11, 2004

03-Environmental Management
SHA-5-KP R64.7 (PM R40.2)
03 172 02 378900
Antlers Bridge Replacement

Dear :

Thank you for participating in the public information meeting for the proposed Antlers Bridge Replacement project and for taking the time to provide input. Following are the questions you submitted on a project comment card. Our responses with corresponding numbers follow the questions.

1. What will be done with the existing bridge?
2. Is there a plan to incorporate pedestrians or cycling in a safer situation?
3. Will the elevation of the bridge compensate for anticipated changes – such as future plans to raise the dam?
4. Will there be any type of lighting?

1. The existing bridge will be left in place during construction to accommodate Interstate 5 traffic. Upon completion of the new bridge, traffic will be diverted to the new bridge and the old structure will be removed. Caltrans has no plan to preserve the existing bridge due to its condition and the maintenance costs associated with leaving it in place. If an agency or organization were interested in preserving the bridge, Caltrans would investigate options for transferring ownership of the structure. Assuming the bridge will be removed, the steel and concrete will be recycled and/or disposed of at a facility approved by Caltrans. The project also proposes to reconstruct a section of highway immediately south of the bridge to improve the alignment. Sections of highway abandoned due to the realignment will be obliterated and reforested where possible.
2. Pedestrians are prohibited on this section of Interstate 5, however bicycles are permitted. Preliminary plans call for 10-foot wide shoulders, which will improve safety for bicyclists, disabled motorists, and Caltrans Maintenance staff. In addition, it is proposed to include a center median barrier and see-through bridge rail with fence railing. However, these types of details have not been confirmed at this stage in the project development process.
3. Caltrans is currently gathering information, including consultation with the Bureau of Reclamation regarding their proposal to increase the holding capacity of Shasta Lake, to determine details such as possible bridge alignments and elevation requirements.
4. Preliminary plans include safety lighting on the bridge.

If you have any additional questions or comments, please feel free to write or call me at (530) 225-3308, or the project Environmental Coordinator, Chris Quiney, at (530) 225-3174.

Sincerely,

JONATHAN OLDHAM, Chief
Office of Environmental Management
North Region - Redding

Appendix D Title VI Policy Statement

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE DIRECTOR
1120 N STREET
P. O. BOX 942873
SACRAMENTO, CA 94273-0001
PHONE (916) 654-5266
FAX (916) 654-6608
TTY (916) 653-4086

Flex your power!
Be energy efficient!

January 14, 2005

TITLE VI
POLICY STATEMENT

The California 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, and age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

WILL KEMPTON
Director

"Caltrans improves mobility across California"

Appendix E Summary of Avoidance, Minimization, and/or Mitigation Measures

Environmental Factor	Potential Impact	Avoidance/Minimization Measure	Mitigation Measure
Land Use & Planning	Temporary/intermittent detours and delays for vehicles and boats	Traffic control plan; avoid conflicts with public's use of Antlers boat ramp	N/a
Cultural Resources	Historic property located within APE	Designate and mark ESA	N/a
Visual/Aesthetics	Vegetation removal; new cuts & fills due to highway realignment	Limit vegetation removal to extent practicable and/or leave enough vegetation in place to provide visual screen; designate adjacent riparian habitat as ESA and delineate with temporary ESA fencing; grade disturbed areas to blend into surrounding topography; consider shroud to enclose bridge piers	Plant native woody vegetation in disturbed areas following construction; rock used on the project shall be harvested from within the project limits
Water Quality & Storm water Runoff	Temporary increases in turbidity and suspended solids due to construction; erosion	Ensure appropriate temporary & permanent water quality best management practices are included project	N/A

Environmental Factor	Potential Impact	Avoidance/Minimization Measure	Mitigation Measure
Hazardous Waste	Lead paint on bridge and within soils beneath bridge; asbestos in bridge joints	Include special provisions in contract pertaining to handling and disposal of asbestos & lead paint; notify CARB prior to bridge demolition	N/a
Noise	Temporary increases in airborne and underwater noise & pressure levels due to construction, mainly pile driving and blasting	Construction window for percussive driving of large diameter piles; bubble curtain required for percussive driving of large diameter piles and underwater blasting; include specifications in contract to control blasting; include special contract provisions to limit noise from the contractors operations to a maximum of 86 decibels at a distance of 50 feet between the hours of 9:00p.m. and 6:00a.m.	N/a
Air Quality	Temporary increases in airborne pollutants due to construction, demolition and vehicle/equipment emissions	Notify the CARB prior to construction and demolition	N/a

Environmental Factor	Potential Impact	Avoidance/Minimization Measure	Mitigation Measure
Vegetation	Vegetation removal for roadway realignment and construction access & staging; noxious weeds	Limit vegetation removal to extent practicable; maintain vegetative screen at specified locations; protect adjacent riparian vegetation with ESA fencing; plant native woody vegetation in disturbed areas following construction; utilize equipment wash stations and designate mandatory excess soil storage and disposal sites to prevent spread of noxious weeds, particularly Rush skeleton weed	Implement weed control program for Rush skeleton weed prior to construction; monitor and treat during and post construction

Environmental Factor	**Potential Impact**	**Avoidance/Minimization Measure**	**Mitigation Measure**
Fish & Wildlife	Construction related effects upon terrestrial and aquatic organisms	Create bat habitat (slots) in new bridge; provide funding for California Department of Fish & Game white sturgeon project; install permanent deer fencing/gates to minimize animal crossing conflicts; include special provisions in construction contract to control airborne and underwater blasting	Impose construction windows to avoid critical nesting, rearing and foraging of bald eagles, osprey, cliff swallows and bats; use bubble curtains for percussive driving large diameter piles; utilize bubble curtains and additional measures to control underwater blasting pressure