

Lake 29 Improvement Project

LAKE COUNTY, CALIFORNIA
DISTRICT 1 – LAK – PM 23.6/31.6
EA 2981U0

Draft Environmental Impact Report/ Environmental Assessment



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



June 2007

General Information About This Document

What's in this document?

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

What should you do?

- Please read this EIR/EA. Additional copies of this document as well as the technical studies are available for review at Caltrans District 1, 1656 Union Street, Eureka, CA 95501 and the Lake County Library, 1425 North High Street, Lakeport, CA 95453. This document along with other project information is also available online at: <http://www.dot.ca.gov/dist1/d1projects/lake29/>
- Attend the open forum public hearing. The public hearing will be held on Wednesday, August 8th from 6:00 p.m. to 8:00 p.m. at Konocti Harbor Resort and Spa, located at 8727 Soda Bay Road, Kelseyville, CA 95451.
- We welcome your comments. If you have any concerns regarding the proposed project, please attend the scheduled open forum public hearing and/or send your written comments to Department of Transportation, Attn: Jeremy Ketchum, Office of Environmental Management, 2389 Gateway Oaks Drive, 1st Floor, Sacramento, CA 95833-93401.
- Submit comments by the deadline: **August 27, 2007.**

What happens next?

After comments are received from the public and reviewing agencies, Caltrans and FHWA may: (1) give environmental approval to the proposed project, (2) undertake additional environmental studies, or (3) abandon the project. If the project is given environmental approval and funding is appropriated, Caltrans could design and construct all or part of the project.

For individuals with sensory disabilities, this document can be made available in Braille, large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Department of Transportation, Attn: Jeremy Ketchum, Office of Environmental Management, 2389 Gateway Oaks Drive, 1st Floor, Sacramento, CA 95833-93401; (916) 274-0621 Voice, or use the California Relay Service (800) 735-2929 (TTY to Voice) or (800) 735-2922 (Voice to TTY).

It should be noted that at a future date FHWA or another federal agency may publish a notice in the Federal Register, pursuant to 23 United States Code Section 139(I), indicating that a final action has been taken on this project by FHWA or another federal agency. If such notice is published, a lawsuit or other legal claim will be barred unless it is filed within 180 days after the date of publication of the notice (or within such shorter time period as is specified in the federal laws pursuant to which judicial review of the federal agency action is allowed). If no notice is published, then the lawsuit or claim can be filed as long as the periods of time provided by other federal laws that govern claims are met.

Widen and improve State Route 29 from just east of its intersection with Diener Drive at PM 23.6 to west of the SR 175 junction at PM 31.6 in Lake County, California

DRAFT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL ASSESSMENT

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

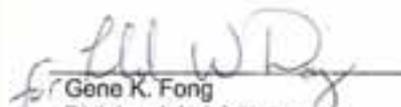
U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration, and

THE STATE OF CALIFORNIA
Department of Transportation

6/22/07
Date of Approval


Katrina C. Pierce
Chief, North Region Environmental Planning
California Department of Transportation

6/28/2007
Date of Approval


Gene K. Fong
Division Administrator
Federal Highway Administration

Summary

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) propose to improve State Route (SR) 29 in Lake County in order to improve east-west connectivity in this portion of the state and handle projected traffic volumes on this highway. In Lake County, the existing highway system consists primarily of two-lane facilities in rolling to mountainous terrain. This project would widen the existing two-lane highway to a four-lane divided expressway with access control. The project corridor is located between the communities of Lower Lake and Kelseyville and is approximately 8.0 miles in length.

The proposed project is a joint project by Caltrans and FHWA and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans is the lead agency under CEQA, and FHWA is lead agency under NEPA.

Some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA. Because NEPA is concerned with the significance of the project as a whole, it is quite often the case that a “lower level” document is prepared for NEPA. One of the most commonly seen joint document types is an Environmental Impact Report/Environmental Assessment (EIR/EA).

Following receipt of public comments on the Draft EIR/EA and circulation of the Final EIR/EA, the lead agencies will be required to take actions regarding the environmental document. Caltrans will determine whether to certify the EIR and issue Findings and a Statement of Overriding Considerations, and FHWA will decide whether to issue a Finding of No Significant Impact (FONSI) or require an Environmental Impact Statement (EIS).

S.1 Purpose and Need

The growth in both population and through traffic in Lake County has created the need for increased capacity along SR 29. This corridor serves the local communities of Lakeport, Kelseyville, Lower Lake, and Middletown, as well as automobile and commercial truck traffic traveling between United States Highway 101 (US 101) and Interstate 5 (I-5). The current highway is a rural two-lane road that lacks the capacity to safely and effectively accommodate anticipated traffic growth. By expanding the

section of highway to four lanes with controlled access, capacity would be increased and highway safety would be significantly improved. In addition, the new expressway would assist in achieving the long-range plan to divert traffic from communities on the northern end of Clear Lake, where pedestrian and nonmotorized traffic safety have been an ongoing concern. The proposed project would accommodate local and state transportation planning goals as set forth in the Lake County/City Area Planning Council's 2005 *Lake County Regional Transportation Plan (RTP)*¹ and the Caltrans 1998 *Interregional Transportation Strategic Plan (ITSP)*.

S.2 Project Description

Four potential “build” alternatives were evaluated in the Draft EIR/EA, plus a no build alternative. Each of the build alternatives represents alternate alignments of the roadway. The alternatives are as follows:

Alternative A—No Build Alternative

Alternative A is the No Build Alternative. The roadway would remain as it exists now, and no widening or realignment would occur.

Alternatives C1, C2, C3, and D

Alternatives C1, C2, C3, and D all propose to widen SR 29 to a four-lane divided expressway with access control. Each alternative would be 8.0 miles long and would begin at Post Mile (PM) 23.6 and end at PM 31.6. Alternative C1 would maintain the existing centerline while upgrading curves to a 68-mile-per-hour (mph) design speed and adding a paved drainage ditch in the median. Alternative C2 would shift the C1 design centerline 30 feet to the north while otherwise maintaining a similar design. Alternative C3 would shift the C1 design centerline 30 feet to the south while otherwise maintaining a similar design. Alternative D would run both north and south of the existing centerline in order to avoid sensitive environmental resources. It would also minimize large slope cuts, in order to minimize impacts and reduce project costs, though the design speed would remain at 68 mph. For each alternative, two interchange options are under consideration at this time for the SR 29/281/Red Hills Road intersection: a spread diamond or partial (two-quadrant) cloverleaf with roundabouts, with two further frontage road options for each type of interchange (see Section 2.6.2.2 for a more detailed description of the interchange options).

¹ See Chapter 7, *References*, for full citations of all reports and documents referred to in this document. When available, World Wide Web addresses are also provided in Chapter 7. Free access to the World Wide Web is available at many libraries, including all branches of the Lake County Library.

Alternative D is expected to result in the fewest impacts to sensitive environmental resources, including endangered plant species, and thus has been identified as the Caltrans preferred alternative; however, final selection of an alternative will not be made until the impacts have been further evaluated in light of any comments received.

S.3 Potential Impacts and Avoidance, Minimization, and/or Mitigation

Potential impacts and avoidance, minimization, and/or mitigation measures are summarized in Table S-1 at the end of this section. Details on impacts and avoidance, minimization, and/or mitigation are provided in Chapter 2.

S.4 Areas of Potential Controversy

CEQA Guidelines (Section 15123) and NEPA Regulations (40 Code of Federal Regulations [CFR] 1502.12) require the Summary to identify areas of controversy known to the lead agency including issues raised by other agencies and the public.

S.4.1 Community Impacts

Each of the build alternatives will require both residential and business relocations, with Alternative C3 requiring the greatest number of relocations. Community impacts, including relocations, are discussed in Section 2.4.

S.4.2 Noise

Residents within the project area have expressed concern about potential increased noise levels. Potential noise impacts are discussed in Section 2.14.

S.4.3 Endangered Plants

Early coordination with the United States Fish and Wildlife Service (USFWS) has revealed that the presence of three endangered plant species located within the project vicinity is an area of potential controversy.

Burke's goldfields (*Lasthenia burkei*) is a federal and state listed endangered species and a California Native Plant Society (CNPS) List 1B species. Several populations of Burke's goldfields were identified within the project area with populations ranging from a few individuals to several thousand.

Lake County stonecrop (*Parvisedum leiocarpum*) is an annual herb that is a federal and state listed endangered species and a CNPS List 1B species. Four populations of Lake County stonecrop were identified within the project area with populations ranging from hundreds to tens of thousands of individuals.

Few-flowered navarretia (*Navarretia leucocephala* ssp. *pauciflora*) is federally listed as endangered, state listed as threatened, and is a CNPS List 1B species. Several populations of few-flowered navarretia were found within the project area with populations ranging from a few individuals to several thousand.

Caltrans has, to date, made substantial efforts to avoid potential direct and indirect effects to these plant species, including substantial changes to Alternative D, the Caltrans preferred project alternative.

Based on the best scientific and commercial data available at this time, Caltrans does not anticipate that Alternative D will result in any direct or indirect effects to these species. The revisions that have been made to Alternative D to avoid these species will, however, consequently result in increased impacts to other environmental resources (including cultural resources and wetlands), increased disposal quantities, and increased project costs. Alternatives C1, C2, and C3 will result in direct effects and potential indirect effects to these species.

In order to address ongoing concerns regarding potential effects to these species, Caltrans plans to undertake further research and perform additional studies, the results of which will be included in the Biological Assessment that will be submitted to USFWS for this project² and with the final environmental document for this project.

S.4.4 Wetlands and Other Waters of the U.S.

Within the Environmental Study Limits (ESL) for this project, wetland types include freshwater marsh, irrigated pasture, riparian scrub, ruderal wetland, vernal marsh, and vernal pool. Each of the build alternatives will result in impacts to these wetlands, with Alternative D³ having the greatest impacts to wetlands and other waters of the U.S. under the jurisdiction of the United States Army Corps of Engineers (USACE).

² See Section 4.6 for a complete description of avoidance efforts to date and additional research and studies that will be undertaken to further assess potential effects to these species.

³ Revisions made to Alternative D to avoid impacts to endangered plant species have resulted in 1.15 additional acres of impacts to Section 404 jurisdictional wetlands for this alternative. Were it not for these revisions, Alternative D would have resulted in the fewest impacts to Section 404 jurisdictional wetlands.

Potential impacts to wetlands and other waters of the U.S. are discussed in Section 2.16.

S.5 Permits and Approvals Needed

The following regulatory permits or approvals must be issued before construction can commence:

- USACE Section 404 authorization under the Federal Clean Water Act
- Regional Water Quality Control Board (RWQCB) Section 401 certification
- California Department of Fish and Game (CDFG) Streambed Alteration Agreement
- USFWS formal consultation under Section 7 of the Federal Endangered Species Act, initiated by FHWA
- Formal concurrence from the State Historic Preservation Officer (SHPO) with Caltrans/FHWA findings with regard to cultural resources

Table S-1 Summary of Potential Impacts and Avoidance, Minimization, and Mitigation Measures

Potential Impact (EIR/EA Section)		No Build Alternative	Build Alternatives				Avoidance/Minimization	Mitigation
			C1	C2	C3	D		
Land Use (2.1)		None	288 acres of new right of way	324 acres of new right of way	350 acres of new right of way	322 acres of new right of way	None	None
Growth (2.2)		None	Unlikely to induce growth	None	None			
Farmlands & Timberlands (2.3)	Total Farmland (acres)	0	387	423	446	322	None	None
	Williamson Act Farmlands	0	0	0	0	0	None	None
Community Impacts (2.4)	Business displacements	0	10 to 12 commercial acquisitions (depending on interchange option)	9 to 10 commercial acquisitions (depending on interchange option)	11 to 12 commercial acquisitions (depending on interchange option)	3 to 10 commercial acquisitions (depending on interchange option)	Acquisition, relocation assistance	None
	Housing displacements	0	6 to 7 total (depending on interchange option)	6 to 7 total (depending on interchange option)	6 to 7 total (depending on interchange option)	5 to 6 total (depending on interchange option)	Acquisition, relocation assistance	None
Utilities/Emergency Services (2.5)		None	Relocation of bus stop, >2000 feet of electrical and AT&T fiber optic cables, fiber optic regeneration station	Relocation of bus stop, >2000 feet of electrical and AT&T fiber optic cables, fiber optic regeneration station	Relocation of bus stop, >2000 feet of electrical and AT&T fiber optic cables, fiber optic regeneration station	Acquisition of part of California Department of Forestry and Fire Protection and California Department of Corrections and Rehabilitation facility; relocation of bus stop, >2000 feet of electrical and AT&T fiber optic cables, fiber optic regeneration station	PG&E Substation relocation unlikely to be necessary in final design	None
Traffic and Transportation (2.6)		None	Improved level of service and volume/capacity ratio	None	None			

Table S-1 Summary of Potential Impacts and Avoidance, Minimization, and Mitigation Measures

Potential Impact (EIR/EA Section)	No Build Alternative	Build Alternatives				Avoidance/ Minimization	Mitigation
		C1	C2	C3	D		
Visual/Aesthetics (2.7)	None	Topographical feature change, vegetation loss, and loss of scenic resources from highway and residences in project area	Topographical feature change, vegetation loss, and loss of scenic resources from highway and residences in project area	Topographical feature change, vegetation loss, and loss of scenic resources from highway and residences in project area	Topographical feature change, vegetation loss, and loss of scenic resources from highway and residences in project area	Limit tree and vegetation removal, apply construction and design measures to blend project appearance with natural environment, stockpile duff and topsoil for use during revegetation	Biologist and Landscape Architect-prepared Revegetation and Restoration Plan
Cultural Resources (2.8)	None	Potential impact to portion of prehistoric site found to be eligible for National Register of Historic Places (NRHP)	Potential impact to portion of prehistoric site found to be eligible for NRHP	Potential impact to portion of prehistoric site found to be eligible for NRHP	Potential impact to portion of prehistoric site found to be eligible for NRHP	Environmentally Sensitive Area (ESA) Action Plan; Construction measures	Phase III data recovery investigation in accordance with memorandum of agreement between State Historic Preservation Officer and FHWA
Hydrology and Floodplains (2.9)	None	Temporary channel obstructions during construction, roadway construction within 100-year floodplain	Temporary channel obstructions during construction, roadway construction within 100-year floodplain	Temporary channel obstructions during construction, roadway construction within 100-year floodplain	Temporary channel obstructions during construction, roadway construction within 100-year floodplain	None	None

Table S-1 Summary of Potential Impacts and Avoidance, Minimization, and Mitigation Measures

Potential Impact (EIR/EA Section)	No Build Alternative	Build Alternatives				Avoidance/Minimization	Mitigation
		C1	C2	C3	D		
Water Quality and Storm Water Runoff (2.10)	None	Degradation from operation of roadway; short term degradation from construction of roadway	Degradation from operation of roadway; short term degradation from construction of roadway	Degradation from operation of roadway; short term degradation from construction of roadway	Degradation from operation of roadway; short term degradation from construction of roadway	Erosion and sediment control, adherence to NPDES permit conditions, Storm Water Pollution Prevention Plan (SWPPP) prepared by Contractor; groundwater handling and disposal requirements	None
Geology, Soils, Seismic, Topography (2.11)	None	None	None	None	None	Adherence to Caltrans Seismic Design criteria and Uniform Building Code for Seismic Zone 3, .site specific geotechnical boring and testing before construction	
Hazardous Waste and Materials (2.12)	None	No known hazardous waste sites, routine construction material use (oil, concrete, diesel), possible occurrence of lead or asbestos	No known hazardous waste sites, routine construction material use (oil, concrete, diesel), possible occurrence of lead or asbestos	No known hazardous waste sites, routine construction material use (oil, concrete, diesel), possible occurrence of lead or asbestos	No known hazardous waste sites, routine construction material use (oil, concrete, diesel), possible occurrence of lead or asbestos	Spill and leak containment material on site, pre-demolition surveys for asbestos and lead (naturally occurring and structure-related), site investigation	None

Table S-1 Summary of Potential Impacts and Avoidance, Minimization, and Mitigation Measures

Potential Impact (EIR/EA Section)		No Build Alternative	Build Alternatives				Avoidance/Minimization	Mitigation
			C1	C2	C3	D		
Air Quality (2.13)		None	Temporary construction-related emissions and fugitive dust, possible presence of naturally occurring asbestos	Temporary construction-related emissions and fugitive dust, possible presence of naturally occurring asbestos	Temporary construction-related emissions and fugitive dust, possible presence of naturally occurring asbestos	Temporary construction-related emissions and fugitive dust, possible presence of naturally occurring asbestos	Best management practices; Caltrans Standard Specifications for air pollution control, dust control during construction	None
Noise (2.14)		None	None	None	None	None	None	None
Natural Communities (2.15)		None	271 to 290 acres of natural communities (depending on interchange option), 25 acres of oak woodland (each option)	279 to 298 acres of natural communities (depending on interchange option), 23 acres of oak woodland (each option)	266 to 285 acres of natural communities (depending on interchange option), 24 acres of oak woodland (each option)	264 to 280 acres of natural communities (depending on interchange option), 21 acres of oak woodland (each option)	Limit tree and vegetation removal; fencing and avoidance of ESAs, Revegetation and Restoration Plan	Habitat Mitigation and Monitoring Plan; purchase of compensation riparian habitat
Wetlands (2.16)	Total Section 404 wetlands area	None	6.9 to 9.3 acres (depending on interchange option)	6.9 to 9.7 acres (depending on interchange option)	7.2 to 9.6 acres (depending on interchange option)	7.0 to 9.3 acres (depending on interchange option)		Fencing and avoidance of ESAs; implementation of permit conditions; Habitat Mitigation and Monitoring Plan; purchase of compensation wetlands and other waters

Table S-1 Summary of Potential Impacts and Avoidance, Minimization, and Mitigation Measures

Potential Impact (EIR/EA Section)		No Build Alternative	Build Alternatives				Avoidance/ Minimization	Mitigation
			C1	C2	C3	D		
Wetlands (2.16)	Total Section 404 other waters of the U.S. area	None	0.9 to 1.0 acres (depending on interchange option)	0.7 to 0.8 acres (depending on interchange option)	1.1 to 1.2 acres (depending on interchange option)	0.9 to 1.0 acres (depending on interchange option)		Fencing and avoidance of ESAs; implementation of permit conditions; Habitat Mitigation and Monitoring Plan; purchase of compensation wetlands and other waters
Wetlands (2.16)	Total Section 404 wetlands and other waters of the U.S. area	None	7.8 to 10.2 (depending on interchange option)	7.6 to 10.4 (depending on interchange option)	8.4 to 10.8 (depending on interchange option)	7.9 to 10.2 (depending on interchange option)		Fencing and avoidance of ESAs; implementation of permit conditions; Habitat Mitigation and Monitoring Plan; purchase of compensation wetlands and other waters

Table S-1 Summary of Potential Impacts and Avoidance, Minimization, and Mitigation Measures

Potential Impact (EIR/EA Section)	No Build Alternative	Build Alternatives				Avoidance/Minimization	Mitigation
		C1	C2	C3	D		
Plant and Animal Species (2.17, 2.18)	None	Potential impact to Northwestern pond turtle habitat; 3 to 4 special-status plant species (depending on interchange option), several bat species, raptor and migratory songbird species	Potential impact to Northwestern pond turtle habitat; 3 special-status plant species (each option), several bat species, raptor and migratory songbird species	Potential impact to Northwestern pond turtle habitat; 3 to 4 special-status plant species (depending on interchange option), several bat species, raptor and migratory songbird species	Potential impact to Northwestern pond turtle habitat; 4 to 6 special-status plant species (depending on interchange option), several bat species, raptor and migratory songbird species	Limits on tree and vegetation removal; fencing and avoidance of ESAs; assessment by bat biologist; use of buffer zones; provisions for migratory bird protection in project plans; preconstruction survey for Northwestern pond turtle	Habitat Mitigation and Monitoring Plan, with potential contribution to conservation bank or fund
Threatened and Endangered Species (2.19)	None	Potential habitat for California red-legged frog; 65 elderberry bushes that are potential habitat for valley elderberry longhorn beetle; Burke's goldfields, few-flowered navarretia, Lake County stonecrop	Potential habitat for California red-legged frog; 91 elderberry bushes that are potential habitat for valley elderberry longhorn beetle; Burke's goldfields, few-flowered navarretia, Lake County stonecrop	Potential habitat for California red-legged frog; 74 elderberry bushes that are potential habitat for valley elderberry longhorn beetle; Burke's goldfields, few-flowered navarretia, Lake County stonecrop	Potential habitat for California red-legged frog; 75 elderberry bushes that are potential habitat for valley elderberry longhorn beetle	Fencing and avoidance of ESAs; preconstruction survey for California red-legged frog	Transplant of elderberry shrubs with stems >1 inch diameter; compensation plantings of elderberry shrubs at approved ratio; Habitat Mitigation and Monitoring Plan; compensatory mitigation for Burke's goldfields, few-flowered navarretia, Lake County stonecrop

Table S-1 Summary of Potential Impacts and Avoidance, Minimization, and Mitigation Measures

Potential Impact (EIR/EA Section)	No Build Alternative	Build Alternatives				Avoidance/ Minimization	Mitigation
		C1	C2	C3	D		
Invasive Species (2.20)	None	None	None	None	None	Contract requirements to limit spread of invasive species	None
Cumulative Impacts (2.21)	None	None	None	None	None	None	None

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List of Technical Studies Prepared Under Separate Cover

The following technical studies were prepared to support this environmental document:

- Air Quality Analysis Report, April 2003
- Addenda to the Air Quality Analysis Report, December 2006 and April 2007
- Community Impact Assessment, September 2003 (Updated June 2007)
- Floodplain Report, April 2003 (Updated December 2006)
- Historic Property Survey Report, March 2003
- Supplemental Historic Property Survey Report, August 2006
- Initial Site Assessment (ISA), April 1999
- Supplemental ISA, August 2002, March 2003, and April 2006
- Natural Environment Study, June 2007
- Noise Impact Study, June 2003 (Updated November 2006 and January 2007)
- Traffic Analysis Report, May 2004 (Updated forecasts provided March 2007)
- Visual Resources Impact Report, November 2006
- Water Quality Report, June 2003 (Updated March 2007)

List of Abbreviated Terms

AB	Assembly Bill
ACS	American Community Survey
ADI	Area of Direct Impact
APC	(Lake County/City) Area Planning Council
APE	Area of Potential Effects
Basin Plan	Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (RWQCB 1998)
BMP	Best management practice
Cal/OSHA	California Occupational Safety and Health Administration
California Register	California Register of Historical Resources
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCR	California Code of Regulations
CDC	California Department of Conservation
CDCR	California Department of Corrections and Rehabilitation
CDF	California Department of Forestry and Fire Protection
CDFG	California Department of Fish and Game
CEQ	Council for Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CHP	California Highway Patrol
CNPS	California Native Plant Society
CO	Carbon monoxide
CTC	California Transportation Commission
CWA	Clean Water Act
dBA	A-weighted decibel
Dbh	Diameter at breast height
DRIR	Draft Relocation Impact Report
DWR	California Department of Water Resources
EA	Environmental Assessment
EIR	Environmental Impact Report
EIR/EA	Environmental Impact Report/Environmental Assessment
EIS	Environmental Impact Statement
ESA	Environmentally Sensitive Area
ESL	Environmental Study Limits
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FSC	Federal Species of Concern
FSLC	Federal Species of Local Concern
g	Gravity
GHG	Greenhouse gas
GIS	geographic information system
I-5	Interstate 5

IPCC	(United Nations and World Meteorological Organization) Intergovernmental Panel on Climate Change
IRIS	(United States Environmental Protection Agency) Integrated Risk Information System
IRP	Wine Country Interregional Partnership
ISA	Initial Site Assessment
ITSP	Interregional Transportation Strategic Plan (Caltrans 1998)
Konocti Harbor	Konocti Harbor Resort and Spa
LEDPA	Least Environmentally Damaging Practicable Alternative
$L_{eq}(h)$	The noisiest hour expressed as the energy-average of the A- weighted noise level occurring during a one-hour period
LOS	Level of service
MCE	Maximum credible earthquake
MLD	Most likely descendant
MOU	Memorandum of Understanding
mph	Miles per hour
MSAT	Mobile source air toxic
MVM	Million vehicle miles
M_w	Moment magnitude
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NAHC	Native American Heritage Commission
NATA	National Air Toxics Assessment
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
NEPA/404	National Environmental Policy Act/Clean Water Act Section 404
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	Nitrogen dioxide
NOA	Naturally occurring asbestos
NOAA Fisheries	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service (formerly the SCS)
NRHP	National Register of Historic Places
O_3	Ozone
PA	Programmatic Agreement
PCB	Polychlorinated biphenyl
PDT	Project Development Team
PG&E	Pacific Gas and Electric Company
PM	Post Mile
PRC	California Public Resources Code
PSR	Project Study Report
RTP	Regional Transportation Plan
RACM	Regulated Asbestos Containing Materials
RWQCB	Regional Water Quality Control Board
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SCS	Soil Conservation Service (now the Natural Resources Conservation Service)
SHPO	State Historic Preservation Officer

SHPSR	Supplemental Historic Property Survey Report
SO ₂	Sulfur dioxide
SPCA	Society for the Prevention of Cruelty to Animals
SR	State Route
STIP	State Transportation Improvement Program
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
TeNS	Technical Noise Supplement (Caltrans 1998b)
TNAP	Traffic Noise Analysis Protocol (Caltrans 1998a)
US 101	United States Highway 101
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
V/C	Volume to capacity
V:H	Vertical to horizontal
VMT	Vehicle Miles of Travel



Chapter 1 Proposed Project

1.1 Introduction

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) propose to improve State Route (SR) 29 in Lake County from just east of the intersection with Diener Drive at Post Mile (PM) 23.6 to west of the junction with SR 175 at PM 31.6 (Figure 1-1) in order to improve east-west⁴ connectivity in this portion of the state and accommodate projected traffic volumes on this highway. The proposed project is referred to as the Lake 29 Improvement Project.

This project would widen the existing two-lane highway to a four-lane divided expressway with access control. The project corridor is located between the communities of Lower Lake and Kelseyville and is approximately 8.0 miles in length.

This project is programmed in the 2006 State Transportation Improvement Program (STIP) and is funded from Program 20.10.025.700 (New Programming— Interregional Improvement Program. This project is also included in the Lake County/City Area Planning Council (APC) 2005 *Lake County Regional Transportation Plan* (RTP).

1.1.1 Existing Facilities

In Lake County, the existing highway system consists primarily of two-lane conventional undivided highways in rolling to mountainous terrain. The primary routes are SR 20, SR 53, and SR 29 (Figure 1-2). SR 29 connects the Lake County area with the Napa Valley, passing through the city of Lakeport (population approximately 5,200 and the county seat), and the communities of Kelseyville, Lower Lake, and Middletown (all with populations between 1,000 and 3,000).

Within the project limits, SR 29 is a two-lane conventional undivided highway facility, consisting of 12-foot lanes and 1-foot to 8-foot paved outside shoulders. This portion of SR 29 was originally a county road that was brought into the State

⁴ Although SR 29 is considered a northbound/southbound highway, the roadway trends east/west in the project corridor. Except where the specific direction of travel on SR 29 is discussed (northbound or southbound), or unless otherwise noted, the ultimate directions of east and west are used in this document.

Highway System in 1951. Limited geometric improvements were made to the road at that time. Since 1951, additional limited improvements have been made, but the facility has never been brought up to a consistently applied design speed⁵ and the majority of the road follows the 1951 alignment. Consequently, there are many nonstandard curves, sight distance problems, and two major intersections (SR 175 and SR 281) that do not meet current design standards. There are limited passing opportunities for the traveling public, and long queues of cars follow slower-moving vehicles or trucks, creating congestion and unstable traffic flow. Widening SR 29 to a four-lane divided expressway is expected to accommodate current and projected traffic volumes and improve safety.

Lake County residents use SR 29 primarily for utility trips within the county and interregional trips to the Napa Valley, Santa Rosa, and the Bay Area. The number of commuters in the area is growing rapidly, and these commuters travel south on SR 29 to jobs in Napa County and beyond. SR 29 is also used for recreational trips to and from the Napa Valley and the Bay Area. The highway is at the north end of the Napa Valley, and tourists visiting the wine country often extend their trips north on SR 29 to the fast-growing wine areas of Lake County.

SR 29 is of statewide significance as well. Together with SR 20 and SR 53 (around the south shore of Clear Lake), SR 29 forms the Lake County portion of the SR 20 Principal Arterial Corridor.⁶ This corridor provides a significant west-east connection in Northern California from United States Highway 101 (US 101) to Interstate 5 (I-5), connecting northwest California with the Central Valley. This route is vital for the interregional movement of people, goods, agriculture, and recreational travel across the northern part of the state (see Section 1.3.2).

1.2 Project Background

This section describes the history of the Lake 29 Improvement Project and the various alternatives that have been studied over the years. Several alternatives were eliminated during the early project development phases and scoping process. A description of the eliminated alternatives is included in Section 1.5.

⁵ Design speed is defined as the “the maximum safe speed that can be maintained over a specified section of highway when conditions are so favorable that the design features of the highway govern.”

⁶ “Principal Arterial Corridor” is a functional classification—the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide.

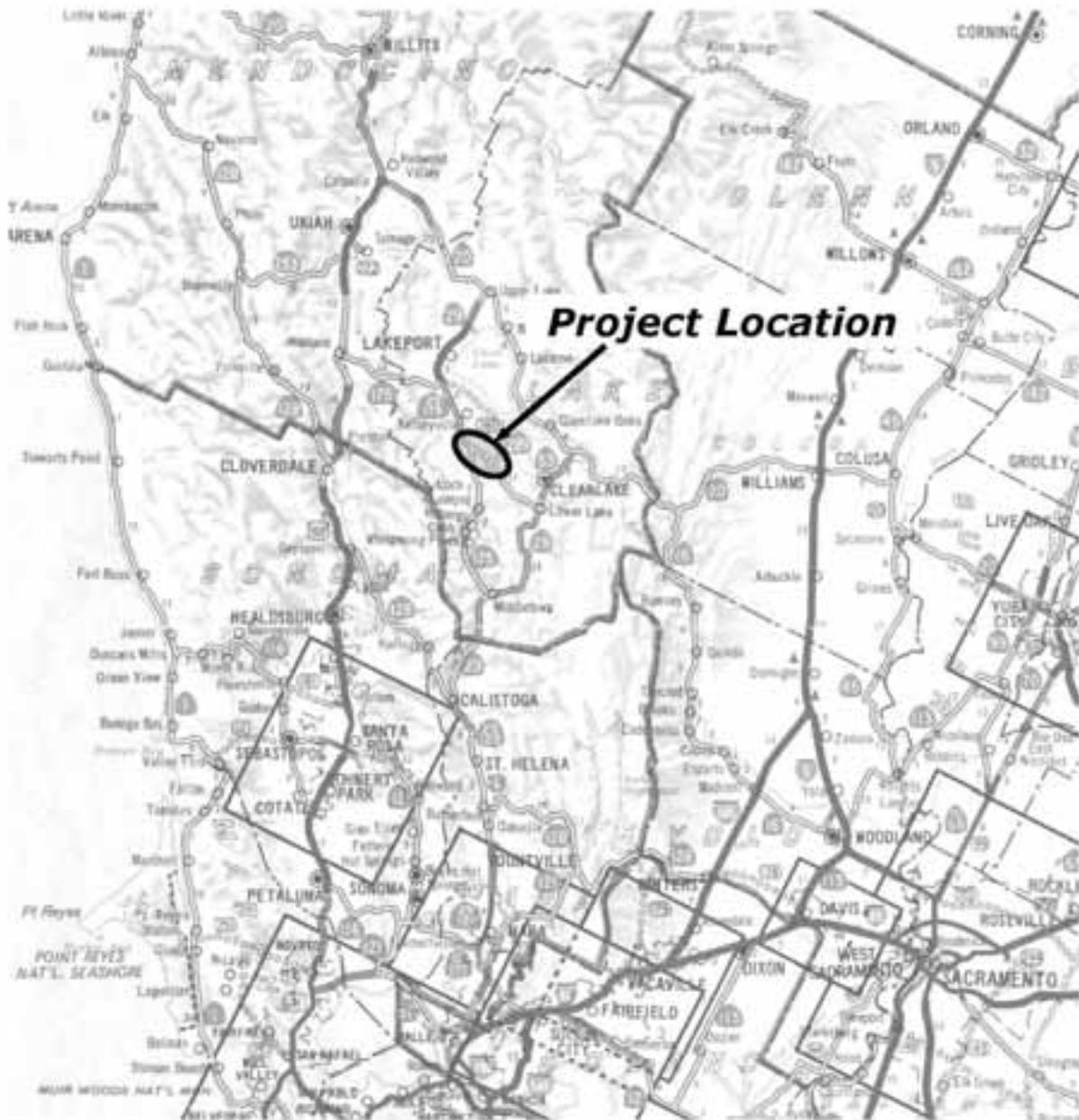
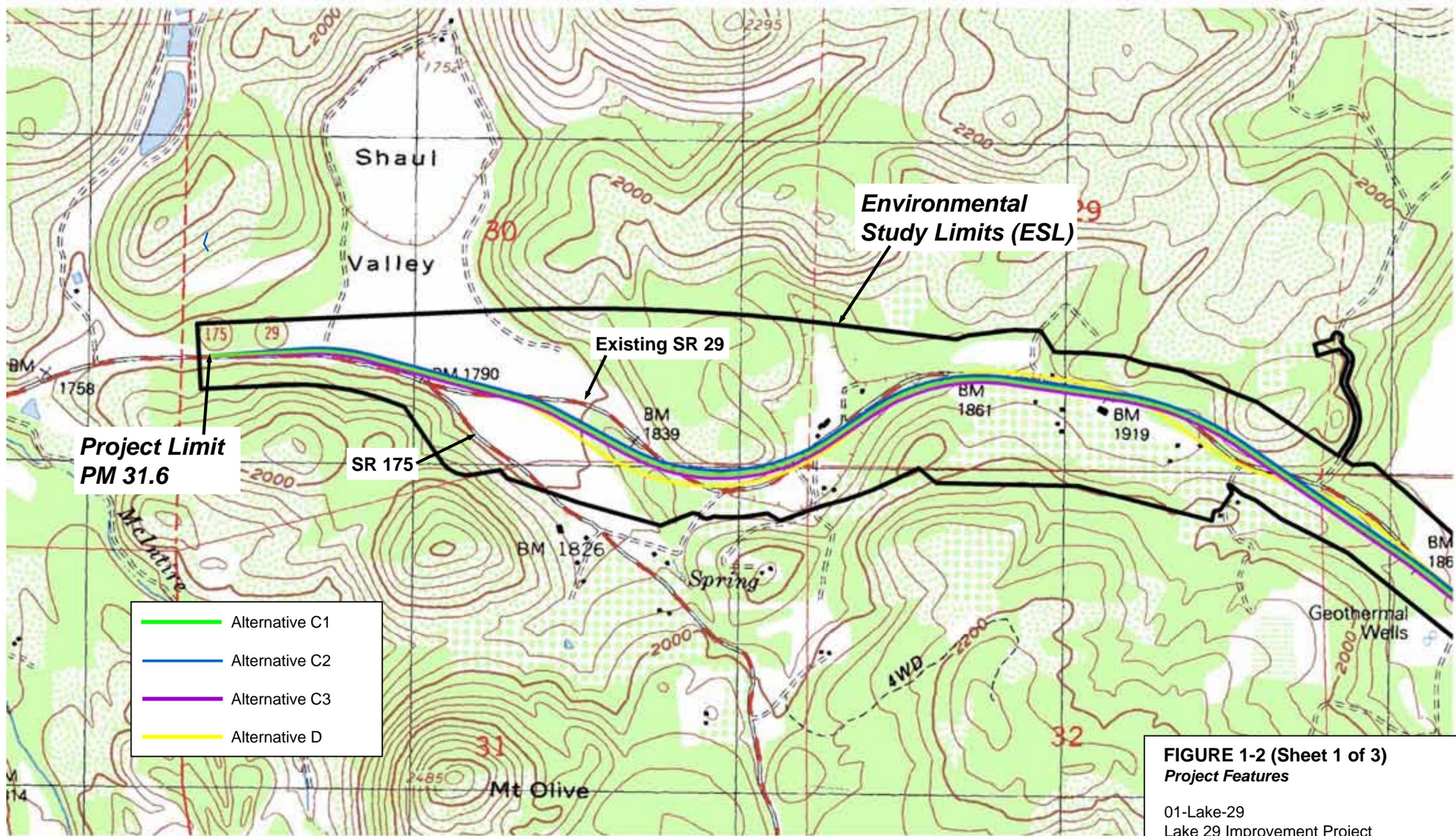


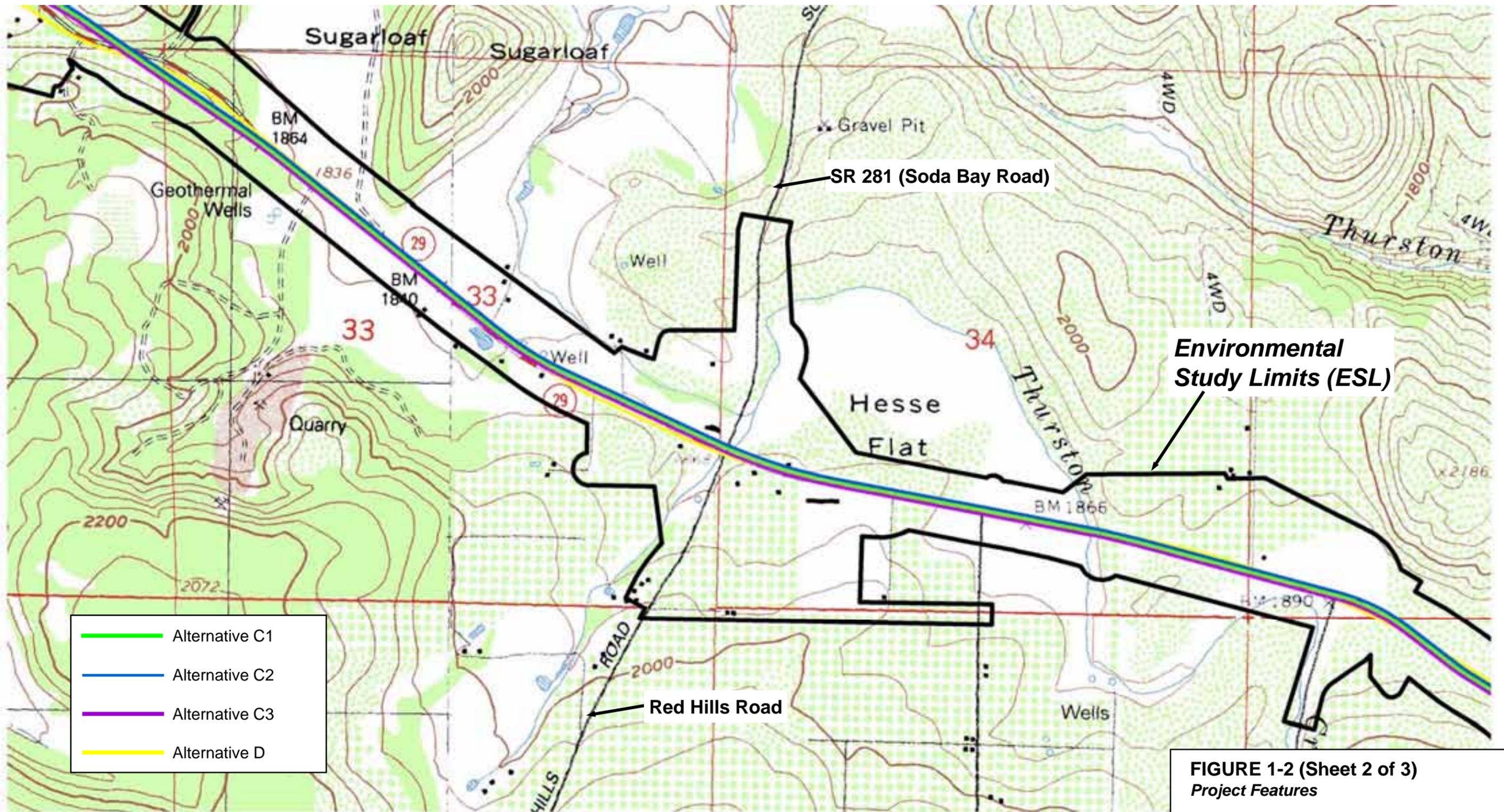
FIGURE 1-1
PROJECT LOCATION
<i>Lake 29 Improvement Project</i>





Source: USGS 7 1/2 minute topographic quadrangle: Kelseyville and Clearlake Highlands, CA.

FIGURE 1-2 (Sheet 1 of 3)
Project Features
 01-Lake-29
 Lake 29 Improvement Project
 PM 023.6 / 031.6
 EA 01-2981U
 State of California
 Department of Transportation



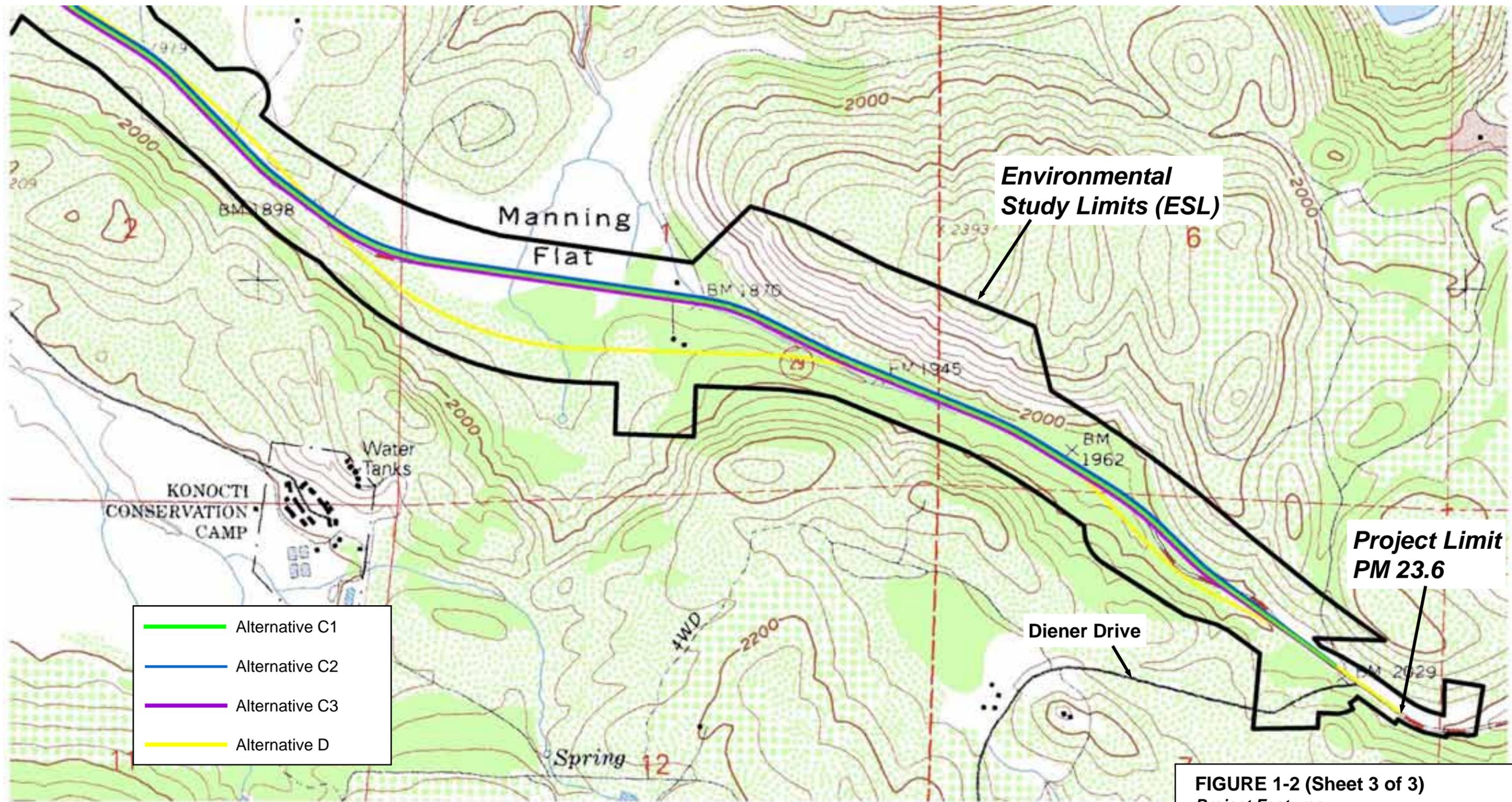
Source: USGS 7 1/2 minute topographic quadrangle: Kelseyville and Clearlake Highlands, CA.

FIGURE 1-2 (Sheet 2 of 3)
Project Features

01-Lake-29
 Lake 29 Improvement Project
 PM 023.6 / 031.6
 EA 01-2981U

State of California
 Department of Transportation





Source: USGS 7 1/2 minute topographic quadrangle: Kelseyville and Clearlake Highlands, CA.



FIGURE 1-2 (Sheet 3 of 3)
Project Features

01-Lake-29
Lake 29 Improvement Project
PM 023.6 / 031.6
EA 01-2981U

State of California
Department of Transportation



1.2.1 Project Development and Environmental Scoping History

In August 1988, Caltrans approved a Project Study Report (PSR) to upgrade SR 29 from PM 23.9 to PM 27.9 (Segment 1). A supplemental PSR for this segment was prepared and approved in 1999. This project was programmed in the 1998 STIP by amendment, and environmental studies began in early 2000.

Another PSR was approved in 1988 to upgrade SR 29 north of the above project from PM 27.9 to 31.1 (Segment 2). This project was programmed in the 1998 STIP for environmental studies, right of way, and engineering. Environmental studies were initiated in December 1998.

Between 1988 and 2002, the Project Development Team (PDT) considered numerous alternatives including passing lanes (identified as an interim improvement only) and various highway, expressway, and freeway alternatives⁷ on varying alignments with differing median widths. Three of the current project alternatives (C1, C2, and C3) have their origins in the expressway alternatives that were developed during this time.

In 2002, Segments 1 and 2 were officially combined in the 2002 STIP and environmental studies for the combined segments were initiated.

A Notice of Preparation was sent to the State Clearinghouse on February 2, 2003. Comments were received from the Lake County Air Quality Management District, the California Department of Toxic Substances Control, the United States Bureau of Land Management, and the United States Fish and Wildlife Service (USFWS). A Notice of Preparation meeting was held March 6, 2003, at the Caltrans Venture Oaks office in Sacramento. The purpose of this meeting was to solicit participation from responsible and trustee agencies to determine the scope of the Environmental Impact Report for the project. Caltrans and the California Department of Fish and Game (CDFG) were the only agencies in attendance.

In March 2003, Caltrans and FHWA initiated the National Environmental Policy Act/Clean Water Act Section 404 (NEPA/404) integration process for this project with the United States Army Corps of Engineers (USACE), the United States Environmental Protection Agency (USEPA), and USFWS. Although not a Signatory

⁷ A conventional highway is a highway with no control of access, which may or may not be divided or have grade separations at intersections. An expressway is an arterial highway (a general term denoting a highway primarily for through traffic on a continuous route) with at least partial control of access, which may be divided and may have grade separations at intersections. A freeway is a divided arterial highway with full control of access and with grade separations at intersections.

Agency, CDFG has also been invited to participate in the NEPA/404 process for this project due to its role as a Trustee Agency. The NEPA/404 integration process integrates the requirements of both NEPA and Section 404 of the Clean Water Act and is formalized in a Memorandum of Understanding (MOU). Under the guidelines of the MOU, the integration process consists of three “checkpoints” that punctuate ongoing coordination efforts. These checkpoints are:

- Purpose and Need
- Identification of the range of alternatives to be studied in the draft Environmental Assessment (EA) or Environmental Impact Statement (EIS), including the criteria used to select and analyze the range of alternatives to be studied
- Preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) and Conceptual Mitigation Plan

At each of these checkpoints, Caltrans sends the checkpoint item to the applicable Signatory Agencies for their “checkpoint response.” See Chapter 4 for a more detailed description of the NEPA/404 integration process. NEPA/404 checkpoint requests and responses can be found in Appendix A.

A public open house was held at Konocti Harbor Resort and Spa in Kelseyville on September 26, 2006. An invitation was mailed to property owners within the project area; tribal representatives; and local, state, and federal officials and agencies. The open house was advertised in the local newspaper, the *Lake County Record-Bee*, and on local radio stations. Approximately 50 people, mostly property owners within the project area, attended the open house. Chapter 4 provides additional information on public participation in the project to date.

This Draft Environmental Impact Report/Environmental Assessment (EIR/EA) represents the current status of the project and project alternatives. Alternative D is expected to result in the fewest adverse effects to sensitive environmental resources, including endangered plant species, and thus has been identified by the Caltrans PDT as the Caltrans preferred alternative; however, the final selection of an alternative will not be made until the impacts from each alternative have been further evaluated in light of any comments received.

Note that funding constraints and limitations may necessitate that this project be constructed in phases. It is likely that construction phases would correlate to the original Segments 1 and 2. For example, Segment 1 would be constructed as the first phase of the project and Segment 2 as the second phase, or vice versa.

1.3 Purpose and Need

1.3.1 Project Purpose

The purpose of this project is to:

- Facilitate the efficient flow of goods and service through Lake County.
- Provide a modern transportation facility that will provide adequate capacity to accommodate anticipated traffic growth.
- Provide a facility with the potential for diverting through traffic (including through truck traffic) from north shore SR 20.
- Accommodate local planning goals as set forth in the 2005 Lake County RTP.
- Help achieve the goals of the Caltrans 1998 *Interregional Transportation Strategic Plan* (ITSP).
- Improve the safety and operation of SR 29.

1.3.2 Project Need

The need to provide a safe, reliable, and modern transportation facility along SR 29 has been long recognized. SR 29 is a Federal Aid Primary Route that together with SR 20 and SR 53 (around the south shore of Clear Lake) forms the Lake County portion of the SR 20 Principal Arterial Corridor from US 101 to I-5. In 1988 the Lake County/City APC and Caltrans joined in a cooperative effort to determine appropriate Route Concepts for state highway routes in Lake County and to establish highway development priorities. The Route Concept selected for this Principal Arterial Corridor was a four-lane freeway/expressway with a “C” concept level of service (LOS).⁸

The development of basic industries in Lake County has been impeded by the difficulty of transporting goods in and out of the county. The 2005 Lake County RTP states: “The current condition of the state highway system throughout the region limits economic development activities due to poor, inefficient access to most areas within the county. It is critical to the economic future of Lake County that the Principal Arterial Corridor be improved. Widening to accommodate the ever-

⁸ Level of service (LOS) is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and convenience. LOS is measured on a graduated scale of A to F, in which A is unrestricted free-flow travel and F is gridlocked, impeded movement.

increasing through traffic and goods movement between Interstate 5 and US 101 is essential.”

The SR 20 corridor is also identified as a Focus Route in the Caltrans 1998 ITSP, a designation having statewide significance, and is one of ten corridors in the state to receive highest priority for completion to minimum four-lane expressway facility standards over the next 20 years.

This project, as proposed by Caltrans and FHWA, would widen SR 29 to a four-lane divided expressway with access control. The project is approximately 8 miles in total length and is located between the communities of Lower Lake and Kelseyville.

The proposed project would start at the top of the Glasgow Grade (Diener Drive), about 3.3 miles north of the community of Lower Lake. For northbound traffic, the top of the Glasgow Grade marks the end of two lanes heading in the northbound direction, and congestion increases with this loss of the second lane. For southbound traffic, this terminus is also logical, as the 4-mile transition length between the SR 29/281/Red Hills Road intersection and Diener Drive would provide traffic a sufficient distance to disperse, allowing for an even flow of vehicles from the improved facility to the unimproved facility south of Diener Drive. The proposed project would end just north of the SR 29/SR 175 intersection, which would address the “directional split” encountered at this location with traffic volumes increasing in the southbound direction caused by traffic turning onto southbound SR 29 from SR 175. This end point would also allow for the realignment of the SR 29/SR 175 intersection to meet current standards.

Lake County has experienced rapid growth in both population and vehicular travel in the last 20 years, and traffic forecasts indicate vehicular volumes on this section of SR 29 are expected to nearly double over the next 20 years. Currently, SR 29 within the project limits operates at LOS D. If no capacity-increasing improvements are made, the LOS is expected to deteriorate to E by the year 2035, causing significant delays. For that reason, implementation of the proposed project would dramatically improve the LOS and volume-to-capacity ratio, and decrease traffic queuing and delays over both existing conditions and the projected conditions under the No Build Alternative. Additionally, SR 281 is a major entry and exit point for this area, and the SR 29/281/Red Hills Road intersection experiences significant congestion and delays. The SR 29/281/Red Hills Road intersection currently operates at LOS E and is expected to drop to LOS F in 10 years with the No Build Alternative.

The proposed project is also expected to significantly improve overall safety to motorists, providing a modern four-lane facility that meets current design standards. Improvements to the horizontal and vertical alignment, addition of lanes that would create safer passing opportunities, removal of fixed objects, widening of shoulders, and the addition of a 46-foot median would provide safety benefits to motorists in terms of increased sight distance, enhanced recovery areas, separation of traffic, and minimized exposure to fixed objects. A collision analysis of this segment of highway revealed that between January 1, 2000, and December 31, 2004, there were 162 collisions, 93 of which resulted in injuries and one of which was fatal. The actual collision rate for the mainline section of SR 29 is 1.10 collisions per million vehicle miles (MVM) traveled versus the state average collision rate of 1.24 per MVM. Although this collision rate is typical of a rural two-lane highway, upgrading the facility to a modern four-lane expressway would significantly reduce this rate. The statewide average for a four-lane expressway is only 0.50 collisions for every MVM traveled. As this project would be built to the most current design standards, it is reasonable to assume that the collision rate would be at or below the statewide average, and that the collision rate would be reduced by almost 60 percent.

Finally, upgrading SR 29 to a four-lane expressway would divert traffic (including trucks) from the “Main Street” communities along the north shore (including Nice, Lucerne, Glenhaven, and Clearlake Oaks), where the safety of pedestrians and nonmotorized traffic as well as traffic noise have been ongoing concerns. This 23-mile segment of SR 20 was recently designated a Pedestrian Safety Corridor as a result of a collaborative effort between Caltrans, the California Highway Patrol (CHP), and local businesses and residents. Ultimately, it is envisioned that through traffic (including truck traffic) between US 101 and I-5 will use the SR 20 Principal Arterial Corridor around the south shore of Clear Lake.

1.4 Project Description

This section describes the proposed project and the design alternatives that were developed by a multidisciplinary team to achieve the project purpose and need while avoiding or minimizing environmental impacts. The alternatives are Alternative A (the No Build Alternative), and Alternatives C1, C2, C3, and D, which propose to widen the existing two-lane conventional highway to a four-lane divided expressway with access control. Each of the build alternatives represents alternate alignments of the roadway. A NEPA 404(b)(1) evaluation of the alternatives is presented in Appendix B.

1.4.1 Alternative A—No Build Alternative

Alternative A is the No Build Alternative. The roadway would remain as it exists now, and no widening or realignment would occur.

1.4.2 Alternatives C1, C2, C3, and D—Build Alternatives

Alternatives C1, C2, C3, and D all propose to widen SR 29 to a four-lane divided expressway with access control. Each alternative would be 8.0 miles long and would begin at PM 23.6 and end at PM 31.6.

To address the traffic volume issues at the SR 29/281/Red Hills Road intersection, an interchange will be studied as an option under each alternative.⁹ For each alternative, two types of interchanges are under consideration at this time: a spread diamond (Figure 1-3) or a partial (two-quadrant) cloverleaf (Figure 1-4), with two further frontage road options for each type of interchange.

1.4.2.1 Build Alternative Descriptions

Alternative C1

Alternative C1 would maintain the existing centerline with geometric modifications to upgrade the existing nonstandard geometric features such as horizontal and vertical curves to a 68 mile-per-hour (mph) design speed. Alternative C1 proposes to construct a 3-foot-wide paved ditch along the median to carry runoff to grate inlets that would connect to cross-drains. Cuts of 1:4 or 1:2 (vertical to horizontal [V:H])¹⁰ are proposed under Alternative C1.

Alternative C2

Alternative C2 would shift the proposed C1 alignment 30 feet to the north of the existing centerline with geometric modifications to upgrade the existing nonstandard geometric features such as horizontal and vertical curves to a 68 mph design speed. Alternative C2 proposes to construct a 3-foot-wide paved ditch along the median to carry runoff to grate inlets that would connect to cross-drains. Cuts of 1:4 or 1:2 (V:H) are proposed under Alternative C2.

⁹ In early 2006, a project was initiated that will install a signal at the intersection of SR 29 and SR 281/Red Hills Road. The signalization project has been approved and is expected to be completed in mid-2007. The proposed project would therefore necessitate the removal or replacement of this signal, depending upon the interchange option selected.

¹⁰ Although this document uses English units of measurement, the metric form has been retained for slope ratios. In the metric form, the first number represents the vertical distance or rise, and the second number represents the horizontal distance or run. For example, a 1:4 slope would rise or fall 1 foot in the vertical direction for every 4 feet in the horizontal direction.



01-2981U	Example Layout of Spread Diamond Interchange at SR 29/281/Red Hills Road	Figure 1-3
Lake 29 Improvement Project		



01-2981U	Example Layout of Partial Cloverleaf (with Roundabouts) at SR 29/281/Red Hills Road	Figure 1-4
Lake 29 Improvement Project		

Alternative C3

Alternative C3 would shift the proposed C1 alignment 30 feet to the south of the existing centerline with geometric modifications to upgrade the existing nonstandard geometric features such as horizontal and vertical curves to a 68 mph design speed. Alternative C3 proposes to construct a 3-foot-wide paved ditch along the median to carry runoff to grate inlets that would connect to cross-drains. Cuts of 1:4 or 1:2 (V:H) are currently being proposed under Alternative C3.

Alternative D

Alternative D (the Avoidance Alternative) would run both north and south of the existing centerline. This alternative was specifically designed to avoid sensitive environmental resources and to reduce project costs by minimizing large cuts, thus decreasing the amount of excess material. Both of these goals would be accomplished by adjusting the horizontal and vertical alignments. As the engineering design progresses, these adjustments would be fine-tuned. The design speed for Alternative D would also be 68 mph. Alternative D would have a storm drain in the median where necessary but with a grass median and ditch line. Near the eastern end of the project limits, there are several hills that would require large cuts. In these locations, retaining walls may be considered under Alternative D. Cuts of 1:4 or 1:2 (V:H) are proposed under Alternative D.

1.4.2.2 Special Considerations

These alternatives will be subject to modification (particularly in the Manning Flat area) as more information regarding project impacts to federally listed endangered plant species (Burke's goldfields, few-flowered navarretia, and Lake County stonecrop) becomes available. This information will include plant surveys, hydrological studies, and analyses of existing and new data on the life history requirements of these plant species. See Section 4.6 regarding ongoing efforts to avoid project impacts to these endangered plants.

1.4.2.3 Features Common to All Build Alternatives

Cross Section

The typical cross section for each alternative would consist of two 12-foot lanes, a 10-foot outside shoulder, and a 5-foot inside shoulder. Each alternative would have a 46-foot median. This median width was chosen to provide adequate room for acceleration/deceleration lanes and maintenance activities and to improve safety. The horizontal radius curve will be 1,969 feet, the minimum radius for a 68 mph facility.

Access

Each alternative would provide access control. Driveway modifications, connector roads, and intersection improvements would be required to provide new single access points to replace the existing multiple road connections. Using a series of frontage roads and at-grade intersections, local and private road connections with SR 29 would be minimized. Frontage roads would be used to collect traffic from multiple roads and driveways and direct it to at-grade intersections. The exact configuration and location of these intersections would depend on the type and volume of vehicles using them, sight distance considerations, and local topography. However, adjacent intersections would be separated by the required 0.5 mile and most would make use of the standard left-turn, acceleration, and deceleration lanes.¹¹

Right of Way

Right of way would be required for all build alternatives, and utilities would need to be relocated.

Storm Water and Drainage Features

Each expressway alternative would incorporate typical storm water features. Roadside drainage ditches and brow ditches¹² would be used in conjunction with attenuation basins to control storm runoff and reduce potential water quality impacts. All cut and fill slopes would be revegetated. Drainage improvements would include the extension, replacement, and installation of culverts as needed as well as the replacement and installation of inlet and outlet treatments (such as headwalls) as needed.

Construction Staging

Temporary haul roads, if constructed by the Contractor, would most likely parallel the proposed and existing roadway. Staging and stockpiling areas would most likely be located within the Environmental Study Limits (ESL; see Figure 1-2) and in areas that have already been heavily disturbed. Locations would be identified in the future. These locations are subject to change, and it is possible that other locations may be found to be more suitable. The locations of the staging and stockpiling areas are also at the discretion of the Contractor. No imported borrow is currently anticipated. As the engineering design develops and cut and fill quantities are refined, imported

¹¹ Note that only Alternative D currently includes improvements to the intersection of SR 29 with Diener Drive. At this location, a left-turn pocket is planned on SR 29 for northbound traffic turning left onto Diener Drive.

¹² A “brow ditch” is typically placed upslope of an excavation to help deflect surface runoff away from the excavation.

borrow may be required. There is also the possibility that unsuitable material may be encountered and cannot be reused as fill.

Maintenance turnouts may be provided under each alternative.

1.4.2.4 Additional Project Features ***Relinquishment of Frontage Roads***

Under each of the build alternatives, portions of the existing SR 29 alignment will serve as frontage roads for the new alignment. According to Section 27 of the California Streets and Highway Code, the State of California shall relinquish to any county or city any portion of any state highway within the county or city that has been removed from the state highway system. Relinquishments are made by a resolution of the California Transportation Commission (CTC).

After construction of the proposed project, portions of the existing alignment that will serve as frontage roads would be relinquished to Lake County. Coordination with Lake County will result in the execution of a Freeway Agreement signed by all jurisdictions involved and will provide the basis for the relinquishment action later taken by the CTC.

According to the California Streets and Highways Code, the State of California cannot “relinquish to any county or city any portion of any state highway that has been superseded by relocation until the department has placed the highway ... in a state of good repair.” This includes maintenance such as litter removal, weed control, and tree and shrub trimming, up to the time of relinquishment. Caltrans will seek to reach an agreement with Lake County as to what constitutes a “state of good repair” prior to the start of construction. The Streets and Highways Code use of the word “highway” includes bridges, culverts, curbs, drains, and all works incidental to highway construction, improvement, and maintenance. The process of presenting the highway in a state of good repair cannot include such work as roadway widening, new construction, or major reconstruction. It may include preventive maintenance, such as sealing asphalt concrete surfaces.

1.5 Alternatives Considered But Eliminated From Further Discussion

The 1988 PSR prepared for Segment 1 (PM 23.9 to 27.9) included four project alternatives: 1) no build, 2) passing lanes in both directions, 3) widening to a four-lane expressway, and 4) widening to a four-lane undivided highway. Both the

expressway and highway alternatives considered widening to both sides of the existing centerline without upgrading the horizontal or vertical curves to meet current design standards.

Alternatives considered in the 1988 PSR for Segment 2 (PM 27.9 to 31.1) were the same as those in the 1988 PSR for Segment 1, and again, did not include upgrading the existing facility to meet current design standards.

By mid-1997, continued engineering design work had identified substantial cost increases to the 1988 PSR alternatives, as well as limitations in the ability of these alternatives to address roadway deficiencies. As a result, five additional build alternatives were developed to provide the necessary improvements, and in early 1999, a supplemental PSR was prepared for Segment 1. The six alternatives in the 1999 supplemental PSR included a no build alternative, a passing lane alternative, and four expressway alternatives on varying alignments with differing median widths. These alternatives all provided improved geometrics consistent with a 62 mph design speed throughout the project limits.

On May 20, 1999, a PDT meeting was held in Lakeport. Representatives from Caltrans, CHP, the Lake County/City APC, and the Lake County Department of Public Works were in attendance. Alternatives presented at this meeting included the three build alternatives from the original 1988 Project Study Reports, as well as the five additional alternatives developed to provide the needed geometric improvements. All eight of the build alternatives were reviewed for consistency with long-range planning and the four-lane freeway/expressway Facility Standard identified in the 1998 ITSP. At this meeting, it was decided to eliminate all alternatives that did not include upgrading the facility to meet current design standards, including the four-lane undivided conventional highway alternative, and all of the 1988 PSR alternatives were eliminated from further study.

During development of these alternatives, the decision to improve the geometric design raised new possibilities for analysis, specifically the possibility of a freeway alternative, as well as the possibility of considerable alignment shifts (one to the north and one to the south) for Segment 2 (these alternatives were identified as Segment 2 alignments 1A and 1B, respectively). These alternatives were evaluated but later rejected due to significantly higher costs than the other alternatives. The freeway alternative was estimated to be double the cost of the expressway alternatives. In addition, a freeway alternative would likely have resulted in significantly greater

adverse effects to sensitive environmental resources, because a freeway requires complete, rather than partial, control of access as well as grade separations at all intersections.

On April 25, 2001, another PDT meeting was held in Lakeport. Representatives from Caltrans, CHP, Lake County, and FHWA were in attendance. At this meeting, five alternatives were considered: A) the no build alternative, B) passing lanes with alignment corrections, C) four-lane expressway with a 22-foot median, D) four-lane expressway with a 36-foot median, and E) four-lane freeway with a 36-foot median. Additionally, three “sub-alternatives” were identified for further study for each of the expressway/freeway alternatives; one that would maintain the existing centerline, and two that would shift the proposed centerline to either the left (south) or right (north) of the existing centerline. At this time, the four-lane expressway with a 22-foot median alternative was eliminated from further consideration, as the 22-foot median would not provide the benefits of a 36-foot median in terms of consistency with previously improved segments of SR 29, safety, sight distance, drainage, and future planning.

In November 2001, following engineering work by Caltrans Design staff and the initial decision to combine Segments 1 and 2, further refinements to the alternatives were made. The naming convention of the alternatives was changed in order to merge the design and environmental processes of Segments 1 and 2. At this time, the basic alternatives under study were A) no build, B) passing lanes, C) four-lane expressway with a 36-foot median, and D) four-lane freeway with a 36-foot median. Early variations of the passing lane alternative all proposed to construct passing lanes in the same locations, but included different levels of associated roadway improvements. The four-lane expressway alternatives at this time each had a 36-foot median and were differentiated by the location of the proposed centerline. C1 would maintain the existing centerline, C2 would shift the centerline 30 feet to the right (north) of the existing corrected centerline, and C3 would shift the centerline 30 feet to the left (south) of the existing corrected centerline. Alternatives C1, C2, and C3 were based on earlier expressway alternatives for Segment 1, and were carried through Segment 2 when these segments were combined for the 2002 STIP.

In December 2001, the Lake County/City APC formally eliminated the freeway alternative due to costs and funding constraints.

Upon initiation of the NEPA/404 process in March 2003, five alternatives were under consideration:

- Alternative A – No Build
- Alternative B – Passing Lanes. This alternative would construct two sets of passing lanes in both directions of travel. Northbound passing lanes would be provided from PM 25.7 to 26.7 and 28.6 to 29.8. Southbound passing lanes would be provided from PM 24.4 to 25.4 and 29.2 to 30.2.
- Alternative C1 – Four-Lane Expressway. This alternative would widen SR 29 to a four-lane expressway on the existing centerline and upgrade the existing nonstandard geometric features.
- Alternative C2 – Four-Lane Expressway. This alternative would shift the proposed C1 centerline 30 feet to the north of the existing centerline.
- Alternative C3 – Four-Lane Expressway. This alternative would shift the proposed C1 centerline 30 feet to the south of the existing centerline.

In late 2003, following the completion of the initial environmental analysis, a new expressway alternative was developed to minimize the environmental impacts of the project. Engineering design work began in early 2004. Alternative D (the Avoidance Alternative) was specifically designed to avoid sensitive environmental resources, including endangered plant species, and to reduce project costs by both reducing and balancing the amount of cut and fill required. Alternative D was designed with a 46-foot median, rather than the standard 62-foot median for this type of roadway, in order to reduce environmental impacts. The 46-foot median was chosen over the 36-foot median of earlier design alternatives in order to provide adequate room for acceleration/deceleration lanes and maintenance activities, minimize impacts to traffic during construction by providing enough room for construction of the new roadway at a revised profile grade, and improve safety. The 46-foot median will also provide a refuge for cross traffic at intersections by allowing vehicles to cross only two lanes of traffic at one time, rather than all four lanes. For these reasons, Alternatives C1, C2, and C3 were updated to include the 46-foot median as well.

An interchange option also was added to each of the expressway alternatives at this time to address the traffic volume issues at the SR 29/281/Red Hills Road intersection. A signal is currently planned for this intersection, with construction anticipated to begin in mid-2007. The proposed project would necessitate the removal or replacement of this signal, depending upon the interchange option selected.

In 2005, Caltrans proposed to the NEPA/404 signatory agencies that the passing lane alternative (Alternative B) be eliminated from further consideration as it did not meet the purpose and need of the project.

The purpose of this project is to provide a modern transportation facility that will accommodate current and anticipated future growth in the area. As early as 1988, the passing lane alternative had been identified as an interim improvement only, unable to meet the desired LOS beyond the year 2005. Within the project limits, SR 29 currently operates at LOS D while the concept LOS (the desired LOS as established by the 1989 Route Concept Report) for this section of SR 29 is LOS C or better. LOS D is described as a situation in which traffic flow is unstable, speeds are subject to sudden change, and passing is difficult. The LOS is expected to deteriorate to E by the year 2035 if no capacity-increasing improvements are made, causing more congestion and added delays.

When passing opportunities are limited, “platoons” of vehicles develop, increasing driver frustration and the possibility of unsafe passing maneuvers. Due to the presence of a major intersection within the project limits (SR 281/Red Hills Road), passing lanes of a sufficient length are not possible and vehicles would be unable to entirely break free of the platoons due to the insufficient length of the lanes. Rather, faster-moving vehicles would simply pass from one platoon to the next. As a result, the average speeds and LOS for Alternative B would have improved only slightly over both existing conditions and the projected conditions under the No Build Alternative.

At the December 14, 2005, NEPA/404 integration meeting, Caltrans, FHWA, and the NEPA/404 signatory agencies in attendance reached informal consensus regarding the elimination of Alternative B, and in late 2006 USEPA and USACE provided their formal agreement to the current range of alternatives. As discussed in Section 4.6, USFWS did not provide comments on the project purpose and need, alternatives selection criteria, or range of alternatives.

Table 1-1 summarizes the alternatives considered but eliminated from further study.

Table 1-1 Alternatives Considered But Eliminated From Further Study

Alternatives	Reason for Elimination from Further Study
Four-lane expressway with 14-foot median without upgrades to meet current design standards (from 1988 PSR for Segment 1 and Segment 2)	In May 1999, the PDT determined that all alternatives that did not include upgrading the existing facility to meet current design standards should be eliminated.
Four-lane undivided highway with 4-foot paved median without upgrades to meet current design standards (from 1988 PSR for Segment 1 and Segment 2)	In May 1999, the PDT determined that all alternatives that did not include upgrading the existing facility to meet current design standards should be eliminated.
Four-lane expressway with 22-foot median on varying alignments (from 1999 Supplemental PSR for Segment 1)	In May 2001, the PDT determined that all alternatives with a 22-foot median should be eliminated as the 22-foot median would not provide the benefits of a 36-foot median in terms of consistency with previously improved segments of SR 29, safety, sight distance, drainage, and future planning.
Four-lane expressway with a 36-foot median on Segment 2 alignments 1A and 1B	In September 2001, Segment 2 alignments 1A and 1B were dropped due to cost and funding constraints.
Four-lane freeway with a 36-foot median (presented at November 2001 PDT meeting)	In December 2001, the PDT formally eliminated the freeway alternative due to cost and funding constraints.
Passing Lanes	In late 2006, the passing lane alternative was formally eliminated, with consensus from USACE and USEPA, as this alternative does not meet the purpose and need of the project.

1.6 Permits and Approvals Needed

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

Endangered Species Act (Incidental Take Statement)

The FHWA and Caltrans are in informal consultation with USFWS under Section 7 of the Endangered Species Act. Following the public circulation of the Draft EIR/EA, FHWA and Caltrans will enter into formal consultation with USFWS. At this time, a Biological Assessment will be prepared, which will identify impacts of the selected preferred project alternative and proposed mitigation for any affected federally listed species. Consultation will result in a Biological Opinion, which may include reasonable mitigation measures and may include an Incidental Take Statement if there is a No-Jeopardy opinion.

National Emission Standards for Hazardous Air Pollutants

For alternatives that require acquisition of structures, an asbestos survey will be completed prior to demolition activities. Lake County Air Quality Management District permits (National Emission Standards for Hazardous Air Pollutants [NESHAP]) are required for demolition.

Asbestos inspections for a NESHAP permit are performed by California Occupational Safety and Health Administration–certified inspectors. Regulated Asbestos Containing Materials (RACM) identified during the survey are noted on the NESHAP permit. All RACM will be abated by licensed asbestos contractors prior to demolition.

National Pollutant Discharge Elimination System Permit

On behalf of USEPA, the State Water Resources Control Board (SWRCB) has developed and issued a National Pollutant Discharge Elimination System (NPDES) Statewide Storm Water Permit to regulate storm water discharges from all of Caltrans' right of way, properties, and facilities. The permit regulates both storm water and non-storm water discharges during and after construction.

In addition, the SWRCB issues the Statewide Permit for all of Caltrans' construction activities of 1 acre or greater, or a number of smaller projects that are part of a common plan of development with the total area exceeding 1 acre, or projects that have the potential to significantly impair water quality. Caltrans projects subject to the Statewide Storm Water Permit require a Storm Water Pollution Prevention Plan, while other projects, smaller than 1 acre, require a Water Pollution Control Program.

A Storm Water Pollution Prevention Plan will be prepared for the proposed project. The plan requires that pollution sources be identified, and it commits to implementing storm water pollution prevention measures to reduce pollutants in storm water discharges from construction sites both during and after construction.

Section 401 Water Quality Certification

Projects that require a Section 404 permit from USACE are also required to obtain a Section 401 Water Quality Certification or Waiver from the Regional Water Quality Control Board.

Section 404 Individual Permit

An Individual Permit (Clean Water Act Section 404) will be required from USACE for impacts to wetlands and waters of the United States. Although USACE issues this

permit, USEPA has oversight and override authority over the permit. See Chapter 4 for a description of the NEPA/404 integration process.

Section 2080.1 Consistency Determination

Following the completion of the Section 7 consultation process under the Federal Endangered Species Act and the issuance of a Biological Opinion and Incidental Take Statement (if needed), Caltrans will request that, pursuant to California Fish and Game Code Section 2080.1, CDFG determine if the federal decision is consistent with the requirements under the California Endangered Species Act for species that are listed under both acts. If the federal decision is consistent with the state act, then no state permit will be required.

Streambed Alteration Permit

Pursuant to California Fish and Game Code Sections 1600 et seq., a Streambed Alteration Agreement will need to be obtained from CDFG for any of the build alternatives selected, as the result of work that would occur within the bed, bank, or channel of streams within the project area.

State Historic Preservation Officer

Formal concurrence will be obtained from the State Historic Preservation Officer (SHPO) on Caltrans/FHWA findings related to cultural resources.

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

This chapter addresses the environmental impacts of the proposed project as well as identified avoidance, minimization, and mitigation measures that will be carried out as part of the project. Avoidance, minimization, and mitigation measures are discussed for each of the discipline areas covered in the following subsections.

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

Human Environment

2.1 Land Use

2.1.1 Land Use Planning

Because the proposed project location is in unincorporated Lake County, the most pertinent planning document is the Lake County General Plan (Lake County 1981, draft Lake County General Plan Update 2006). In addition, the county has adopted area plans, which are relevant to the project, for Kelseyville to the west of the project area (the Kelseyville Area Plan, dated 1995), Lower Lake to the east of the project area (the Lower Lake Area Plan, dated 1988), and the Rivas Planning Area (adopted January 2007), which includes a small portion of the project area. Other planning documents applicable to the project area include:

- *Lake County Regional Transportation Plan (RTP) 2005* (adopted by the Lake County/City Area Planning Council [APC] in October 2005)
- *Lake County Regional Bikeway Plan* (adopted by the Lake County/City APC in August 2006)
- *State Route 20 Corridor Study* (Dow and Associates August 2000)

Policies in these plans that are pertinent to the proposed project are summarized below.

Lake County General Plan

In November 2006, Lake County released a draft General Plan Update, providing an update to the county's 1981 General Plan. The General Plan is a guidance document that addresses a range of issues, from land use and transportation to resource use and preservation. Many of the issues addressed in the General Plan only indirectly apply to the proposed project. The following goals and policies are relevant to the proposed project and its potential impacts.

Land Use Goal 1: To encourage the overall economic and social growth of the county while maintaining its quality of life standards.

Land Use Policy 1.1, Smart Growth: The county shall promote the principals of smart growth....

Land Use Goal 2: To clearly differentiate between areas within Lake County appropriate for higher intensity urban services and land uses (i.e., high density residential, high density commercial, and industrial) from areas where rural or resource use should be emphasized.

Land Use Policy 2.1, Available Infrastructure: The county shall encourage residential growth to locate in existing urban areas where infrastructure is available. The county shall ensure that development does not occur unless adequate infrastructure is available for that area.

Land Use Policy 2.6, Community Growth Boundaries: The county shall limit urban development to the areas within designated Community Growth Boundaries....

Transportation Goal 1: To provide and plan for a unified, coordinated, and cost-effective countywide road and highway system that ensures safety, maintains adequate levels of service, and the efficient movement of people and goods.

Transportation Policy 1.1, Provision of Adequate Road Network: The county shall establish a road network to accommodate projected growth in traffic volume resulting from residential development, commercial and tourism expansion, and geothermal activity and other industrial development.

Transportation Policy 1.9, Truck Routes: To reduce heavy truck traffic in residential areas and near noise-sensitive land uses, the county shall ensure truck routes are designated in a manner such that traffic noise impacts are minimized.

Transportation Policy 1.10, Construction Methods: The county shall utilize road construction methods that seek to reduce air, water, and noise pollution associated with road and highway development.

Health and Safety Goal 3 (Air Quality): To reduce the generation of air pollutants and promote nonpolluting activities to minimize impacts to human health and the economy of the county.

Health and Safety Policy 3.9, Air Quality Analysis: The county may require an analysis of potential air quality impacts associated with significant new development through the environmental review process.

Health and Safety Policy 3.10, Dust Suppression During Construction: The county shall require dust-suppression measures for grading activities.

Noise Goal 1: To protect county residents from the harmful exposure of excessive noise and prevent incompatible land uses from encroaching upon existing and planned land uses.

Noise Policy 1.8, Coordination with Caltrans: The county should work closely with Caltrans to mitigate noise levels and associated impacts on sensitive receptors near existing and proposed state facilities by requiring noise buffering or insulation measures.

Open Space, Conservation and Recreation Goal 1 (Biological Resources): To preserve and protect environmentally sensitive significant habitats, enhance biodiversity, and promote healthy ecosystems throughout the county.

Open Space, Conservation and Recreation Goal 2 (Scenic Resources): To preserve and protect existing viewsheds and visual quality found in the county.

Open Space, Conservation and Recreation Policy 2.4, Roadway Improvement Guidelines: Within the designated scenic corridors, roadway improvements should be constructed in a manner which minimizes roadway width and thus, reduces domination of the view by road surface; and conforms to the natural contours of the land and minimizes extensive grading and removal of roadside vegetation.

Open Space, Conservation and Recreation Goal 3 (Agricultural Resources): To preserve and maintain a viable and diverse agricultural industry within the county.

Open Space, Conservation and Recreation Policy 3.3, Avoid Extension of Infrastructure into Agricultural Areas: Extension of services, such as sewer and water lines and roadways, into areas preserved for agriculture use should be avoided.

Where necessary, they should be located in public rights of way in order to prevent interference with agricultural operations and to provide ease of access for operation and maintenance. Service capacity and length of lines should be designed to prevent the conversion of agricultural lands into urban/suburban uses.

Open Space, Conservation and Recreation Goal 7 (Cultural Resources): To manage and protect sites of cultural and archaeological importance for the benefit of present and future generations.

Lower Lake Area Plan

A portion of the proposed project would be located in the extreme western edge of the area covered by the Lower Lake Area Plan. This plan, adopted by Lake County in 1988, outlines the goals for the Lower Lake community, issues that must be addressed in order to maintain orderly future growth, and the county's policies toward development and resource preservation in this area. Historically, Lower Lake's economic core has been located on Main Street in the downtown area, east of the State Route (SR) 29/SR 53 intersection. At the time the Lower Lake Area Plan was being prepared, the amount of traffic passing through the area on SR 29 and SR 53 had begun to attract commercial development. The Lower Lake Area Plan anticipates that the transportation corridors, as well as downtown, will attract commercial development oriented toward providing services to tourists in the future. The plan states: "Commercial lands, which are intended to provide services for highway related uses, travelers and tourists, are located adjacent to State Route 29 on the western fringe of the community and east of State Route 53 along Cache Creek in the northwest corner of the community" (Lake County 1988, 6-7).

Kelseyville Area Plan

The proposed project would not be located in the area covered by the Kelseyville Area Plan. However, because Kelseyville is located along SR 29 west of the project area, development in Kelseyville is directly related to the amount of traffic on SR 29, and a project on this route would affect many of the community's residents.

Kelseyville is a relatively small, rural community with growth potential. Kelseyville's plan focuses on the need to provide community services and preserve resources. The plan encourages improvements to SR 29:

Circulation Policy 5.2a-10: "The County should support the upgrading of Route 29 to a four-lane facility, including the implementation of interim projects to create additional passing opportunities" (Lake County 1995, 5-24).

Rivieras Area Plan

Most of SR 29 in the project area is included in the Rivieras Planning Area, which primarily includes the communities on the south side of Clear Lake that are accessed from SR 281. Development in this area is guided by the Rivieras Area Plan (adopted January 2007). The plan projects that population in the Rivieras area will grow from 4,900 in 2000 to over 7,000 in 2025, an increase of 1,500 housing units. Because the Rivieras Area Plan is primarily aimed at residential areas, few of its policies, goals, and objectives directly apply to the proposed project. At the same time, the plan is intended to preserve the Rivieras Planning Area's resources as new development is contemplated, and the proposed project would affect many of these resources.

Resources discussed in the Rivieras Area Plan that could be affected by the project include agricultural land, viewsheds, the area's rural character, transit facilities, waterways, vegetation and wildlife, and bicycle and pedestrian access. Applicable objectives and policies are discussed below.

Vegetation and Wildlife Policy 3.3.1a: Migratory corridors to allow wildlife to move between areas of suitable habitat shall be required around developed and developing areas.

Resources Objective 3.4.1b: Protection of agricultural lands and operations from conflicting uses.

Visual Resources Objective 3.5.2a: To take measures to protect and enhance scenic resources in the Rivieras Planning Area and promote a visually appealing environment.

Visual Resources Objective 3.5.2b: To maintain the rural character of the planning area.

Visual Resources Policy 3.5.2a: The county shall encourage utility lines to be installed underground wherever possible. Where installing utilities underground is not practical, lines shall be sited in a manner that minimizes their visual intrusion.

Housing Objective 5.2.1: Provide for orderly growth of the planning area corresponding to available infrastructure.

Housing Policy 5.2.1a: High-density housing, such as apartments, should not be developed within the Rivieras planning area until appropriate infrastructure is available for the residents of those developments, including sewer, water and public transit.

Streets and Highways Objective 5.3.1: Improve the operation and safety of both the State Highway and County Road Systems within the Planning Area.

Streets and Highways Policy 5.3.1a: Support efforts by Caltrans to expand upon and improve traffic safety of the highway system. Encourage Caltrans to consider the installation of wildlife underpasses.

Transit Objective 5.3.2: Provide for the transit needs of the residents of the Planning Area.

Transit Policy 5.3.2b: Encourage bus stops near population centers in the planning area to facilitate public transit use.

State Route 20 Corridor Study

In August 2000, the Lake County/City APC released the results of the *State Route 20 Corridor Study*, which was undertaken to examine the SR 20 Principal Arterial Corridor in Colusa, Lake, and Mendocino counties.¹³ As a transportation corridor, this route includes SR 20 from United States Highway 101 (US 101) in Mendocino County to the junction with SR 29 in Upper Lake; SR 29 from Upper Lake to the junction with SR 53 in Lower Lake (around the south shore of Clear Lake); SR 53 from Lower Lake to the junction with SR 20; and SR 20 east to Interstate 5 (I-5). Because SR 29 within the project area forms a part of this corridor, the findings and plans included in this study are relevant to the proposed project.

The study emphasizes the importance of the SR 20 Principal Arterial Corridor to Northern California's employers and residents. The SR 20 corridor and SR 299 provide the only significant connections between I-5 and US 101 in Northern California, and these two routes are over 100 miles apart. The proposed corridor improvements are likely to have beneficial impacts on the regional economy. The study states:

The route currently provides connections for truck freight transport between the US 101 and I-5 corridors, and is the only significant access route for local counties, cities and communities to the rest of California. The employment, economic development and investment enhancement opportunities associated with corridor improvements are as important a goal for the corridor areas as meeting traffic flow and access needs (Dow and Associates 2000, 4).

¹³ The SR 20 Principal Arterial Corridor continues east of I-5 in the Sacramento Valley, connecting with Interstate 80 (I-80) in the high Sierras and to I-80 via SR 49 in Auburn (Placer County).

The Corridor Concept Plan as presented in this study for this portion of the SR 20 Principal Arterial Corridor is as follows:

- Make SR 20 a four-lane freeway/expressway from US 101 (north of the city of Ukiah) east to the junction with SR 29, then southerly on SR 29 (South Shore) to the junction with SR 53, then northerly on SR 53 to the junction with SR 20 (North Shore).
- Make SR 20 a two-lane conventional highway, fully improved, with passing lanes easterly from the junction with SR 53 through eastern Lake County and the foothills of Colusa County to the junction with I-5 in the city of Williams.

The *State Route 20 Corridor Study* presented the following conclusion on the potential social and economic consequences of the proposed plan:

As a result of this Study, it is apparent that it will take more than highway improvements to change the economic environment in the rural counties that depend on the Corridor facilities for access. Improvements to travel time and increased traffic safety along the Corridor can be a real catalyst for economic investment. Better access to markets and developable land within the Corridor may provide the incentive for job creation so badly needed along the Principal Arterial Routes involved (Dow and Associates 2000, 34).

Lake County Regional Transportation Plan

The Lake County RTP forms the planning basis for future state highway and local road improvement projects in Lake County. Prepared by the Lake County/City APC, the RTP uses projections of future (20-year) conditions to anticipate transportation needs.

The 2005 RTP was adopted in October 2005. Like the *State Route 20 Corridor Study*, the RTP identifies SR 29 within the project area as part of the larger SR 20 Principal Arterial Corridor providing an east-west connection between I-5 and US 101. The RTP states that the portion of this corridor between Lakeport and Lower Lake, which would include the proposed project, should receive the highest priority for construction. The RTP anticipates that:

When constructed, through traffic on Route 20 will be re-directed to the south of Clear Lake. The Principal Arterial Corridor takes advantage of relatively unconstrained right of way and existing four-lane segments while avoiding the

topographical and environmental constraints, as well as community impacts, of the north shore route (Dow and Associates 2005, 21).

RTP policies and objectives related to the Principal Arterial System include (Dow and Associates 2005, 27):

Policy 1.03: Improve east/west highway circulation within and through Lake County, especially with systematic improvements to the Principal Arterial System.

Objective 1.03.1: Develop the Principal Arterial System as a four-lane freeway/expressway from US 101 in Mendocino County to the SR 53 junction at SR 20, with the SR 29 segment between Lakeport and Lower Lake assigned highest priority for construction.

Objective 1.03.2: Develop the Principal Arterial System as a two-lane facility, with passing lanes, from the SR 53 junction to I-5 in Colusa County.

Objective 1.03.3: Collaborate with regional agencies in Mendocino, Colusa, Sutter, Yuba, and Nevada counties to highlight SR 20 corridor needs for Interregional Improvement Program funding.

Objective 1.03.4: Continue operational improvements on state highways as needed to facilitate goods movement on the designated Hazardous Materials Transportation Route in Lake County.

The Scotts Valley Band of Pomo Indians also owns a parcel of land in the Kit's Corner area.¹⁴ The Tribal Transportation System Element of Lake County's 2005 RTP discusses the preliminary plans for this parcel, which is located on the southeastern corner of the SR 29/281/Red Hills Road intersection. According to the RTP, the preliminary plans for this parcel include approximately 35 homes, an apartment complex, a retirement facility, a restaurant, a museum/cultural center, a park, and a helipad. This parcel is not currently in trust with the United States Department of the Interior's Bureau of Indian Affairs.

2006 Lake County Regional Bikeway Plan

Lake County adopted a Regional Bikeway Plan in August 2006. The plan identifies existing and proposed bikeways in Kelseyville and Lower Lake, but there are no proposals to add a bikeway on or adjacent to SR 29.

¹⁴ The northwest corner of the SR 29/281/Red Hills Road intersection is currently developed with several small businesses including a gas station, a convenience store, a motel, and several small retail spaces (collectively known as Kit's Corner, the name of the convenience store).

The *Lake County Regional Bikeway Plan* uses the California Street and Highways Code's classification for bikeways based on the needs and the physical conditions of the rights-of-way:

- **Class I Bikeway** – Bike Path or Bike Trail. A completely separated right of way for the exclusive use of bicycles and pedestrians with cross flows of motorists minimized. The state standard for minimum paved width of a two-way bike path is 8 feet.
- **Class II Bikeway** – Bike Lane. A restricted right of way for the exclusive use of bicycles with vehicle parking and cross flow by pedestrians and motorists permitted. Bike lanes are normally striped within paved areas of highways and are one-directional with a minimum standard width of 5 feet.
- **Class III Bikeway** – Bike Route. A route for bicyclists designated by signs or other markings and shared with pedestrians and motorists. Bike routes are typically designated to provide linkages to the Bikeway systems where Class I or II Bikeways cannot be provided.

Existing bikeways in the area include the Class II Konocti Road Bikeway in Kelseyville and a portion of the Class II Old State Highway 53 Bikeway in Central Clearlake. Future bikeways are proposed to connect Clearlake to Lower Lake and Kelseyville to Clear Lake State Park.

2.1.2 Affected Environment

2.1.2.1 Lake County

The proposed project is located along a largely undeveloped stretch of SR 29 in Lake County. Lake County is located approximately 40 miles east of the Pacific Coast in Northern California. Lake County is east of Mendocino and Sonoma counties, north of Napa and Yolo counties, and due west of Colusa County. Lake County's topography in the project vicinity is dominated by Clear Lake, the largest freshwater lake wholly contained in the state of California. Clear Lake is a recreational destination for residents throughout Northern California.

The county's population is concentrated in the small communities surrounding the lake (see Figure 2.1-1). SR 20 runs along the lake's northern side. Several communities are located along SR 20, including Clearlake Oaks, Glenhaven, Lucerne, Nice, and Upper Lake. SR 29 runs along the south side of Clear Lake, generally out of sight of the lake. Communities located along SR 29 include North Lakeport, Lakeport (one of the two incorporated cities in Lake County, located approximately

10 miles west of the project area), and Kelseyville. The communities of Clearlake Park, Clearlake, and Lower Lake are located on the eastern side of the lake, along SR 53. Konocti Harbor Resort and Spa (Konocti Harbor), a large resort area, is located on SR 281 between SR 29 and the southern shore of Clear Lake.

2.1.2.2 Existing Land Use Patterns and General Plan Designations in the Project Area

The proposed project would be located in unincorporated Lake County. Therefore, land use, zoning, and development on land in the project area are under the jurisdiction of Lake County. In November 2006, Lake County released a draft General Plan Update. Prior to this, the best available information was found in the General Plan adopted in 1981.

Figures 2.1-2 and 2.1-3 present the Lake County General Plan land use designations for lands along the proposed project corridor. Most of the land adjacent to the highway is designated Rural Land or Rural Residential, indicating its suitability for low-density rural development. Minimum lot size in Rural Residential areas is between 5 and 20 acres. Residential development in the project area consists of individual single-family residences located along SR 29, consistent with the Rural Residential land use designation.

In addition, several areas along the proposed project corridor are designated Agricultural Land, which is the General Plan designation used to protect the county's agricultural resources and to prevent development incompatible with agricultural production. Development in these agricultural areas is limited to one dwelling unit for every 40 acres. There are also two areas along the project corridor that are designated Intensive Agriculture. These lands support vineyards and orchards.

A small area around the intersection of SR 29/281/Red Hills Road is designated Resort Commercial and Local Commercial. The northwest corner of this intersection, designated for Resort Commercial use, is currently developed with several small commercial uses, including a gas station, a convenience store, a motel, and several small retail spaces (collectively known as Kit's Corner, the name of the convenience store). Just east of the Resort Commercial land on the south side of SR 29 is the area designated Local Commercial. This area is occupied by a storage facility and the local office of the Society for the Prevention of Cruelty to Animals (SPCA).



LAKE COUNTY

PROJECT AREA

FIGURE 2.1-1 – LAKE COUNTY

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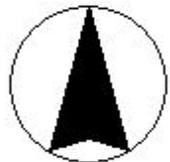
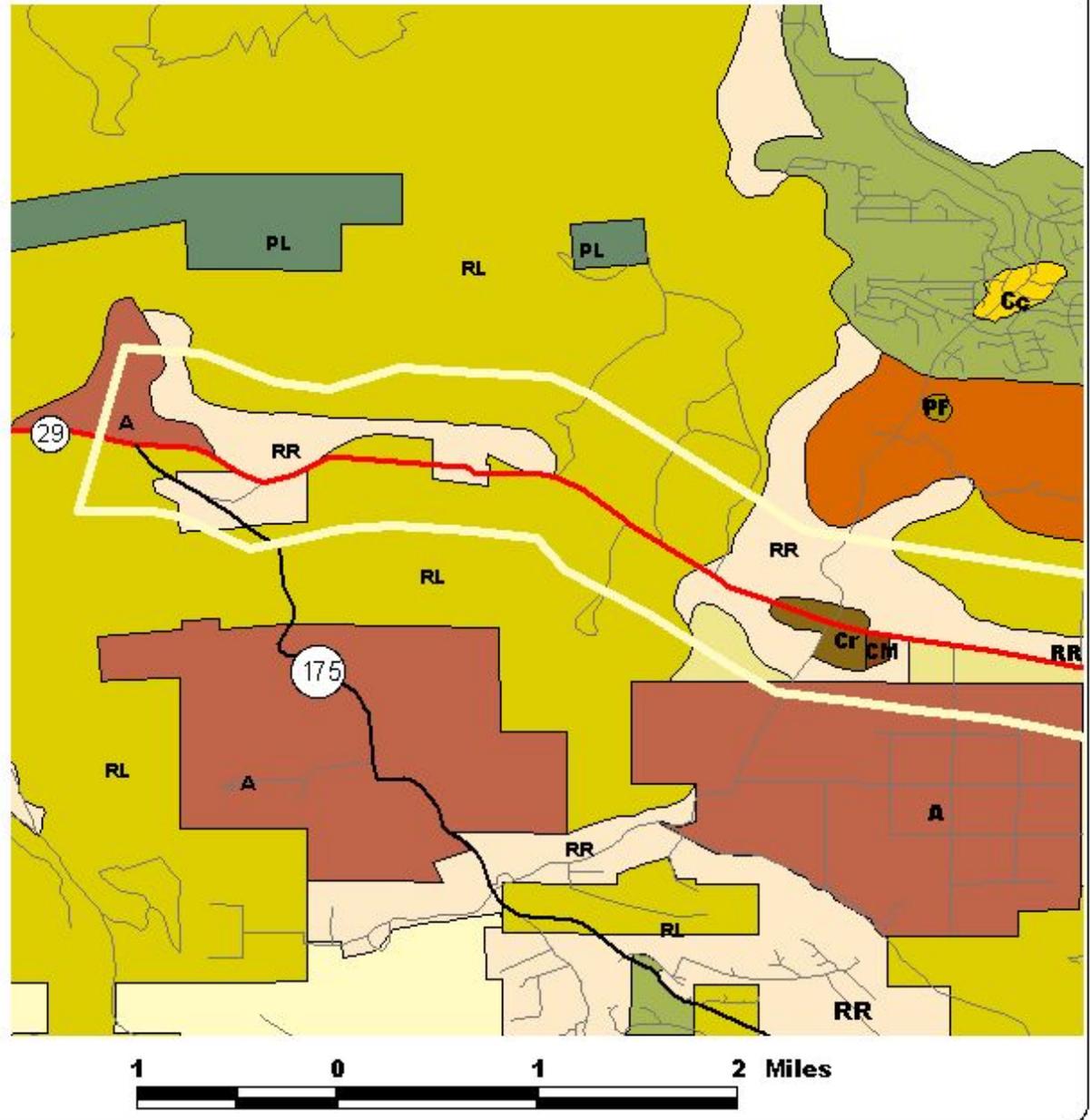
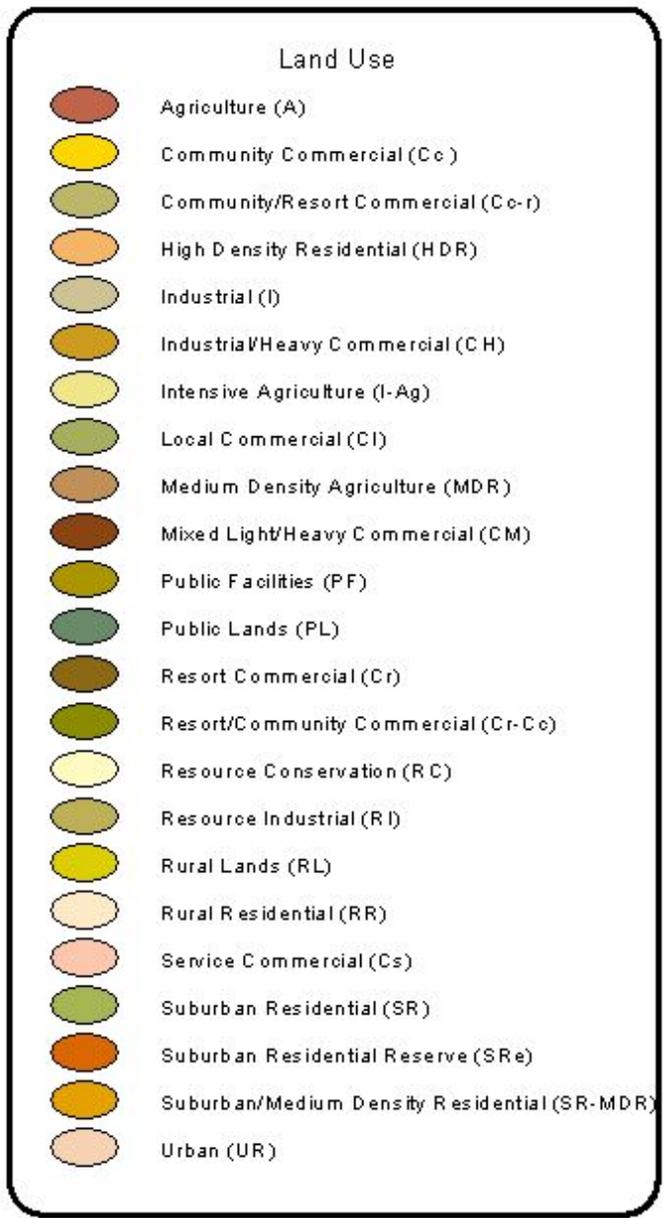
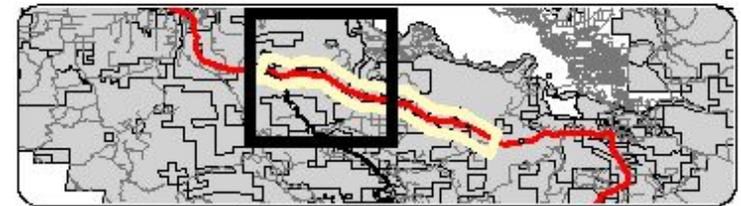


Figure 2.1-2 – Lake County General Plan Land Use, Western Project Area

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 Lake 29 Improvement Project



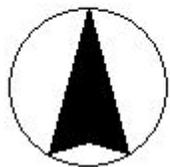
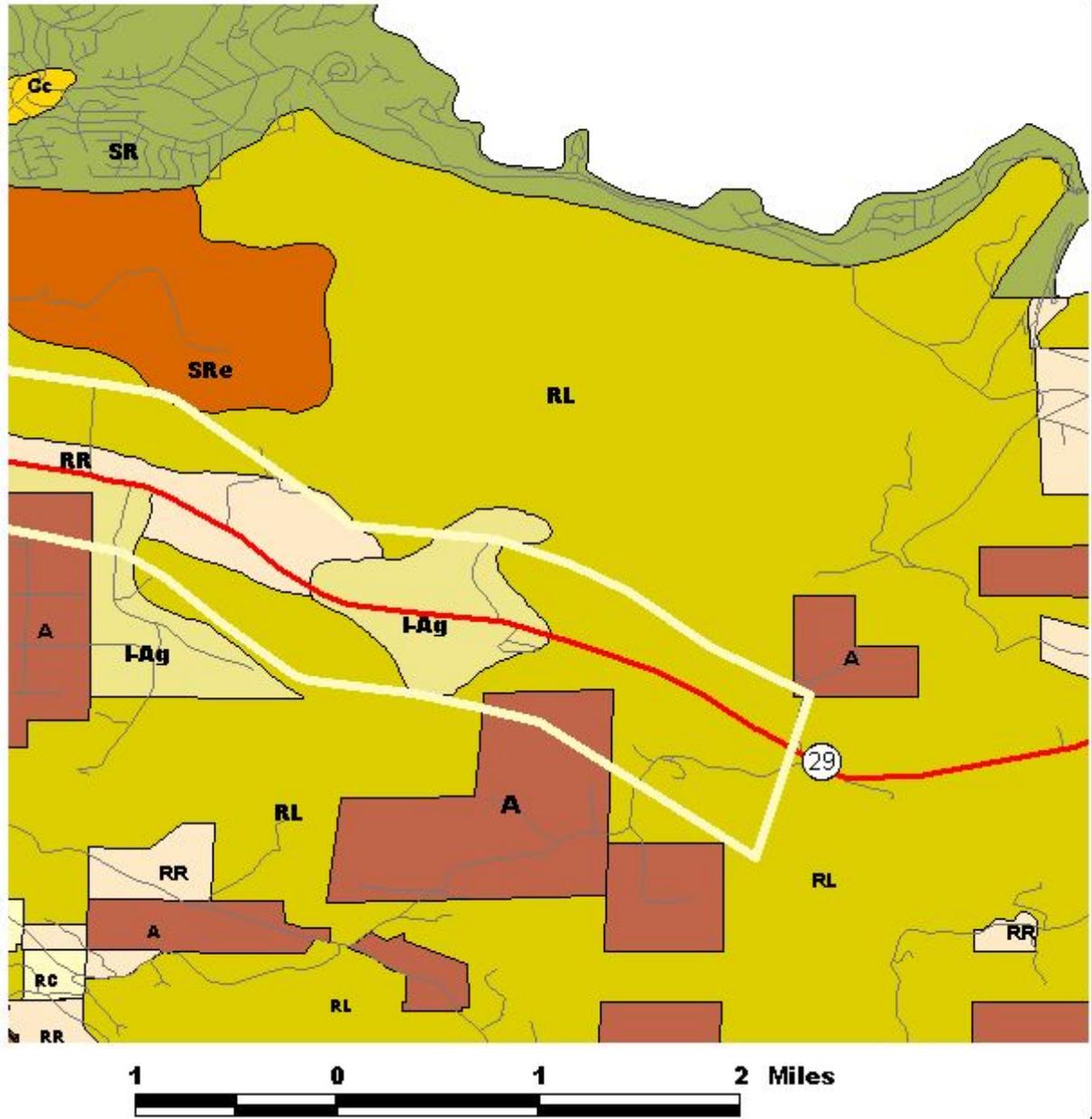
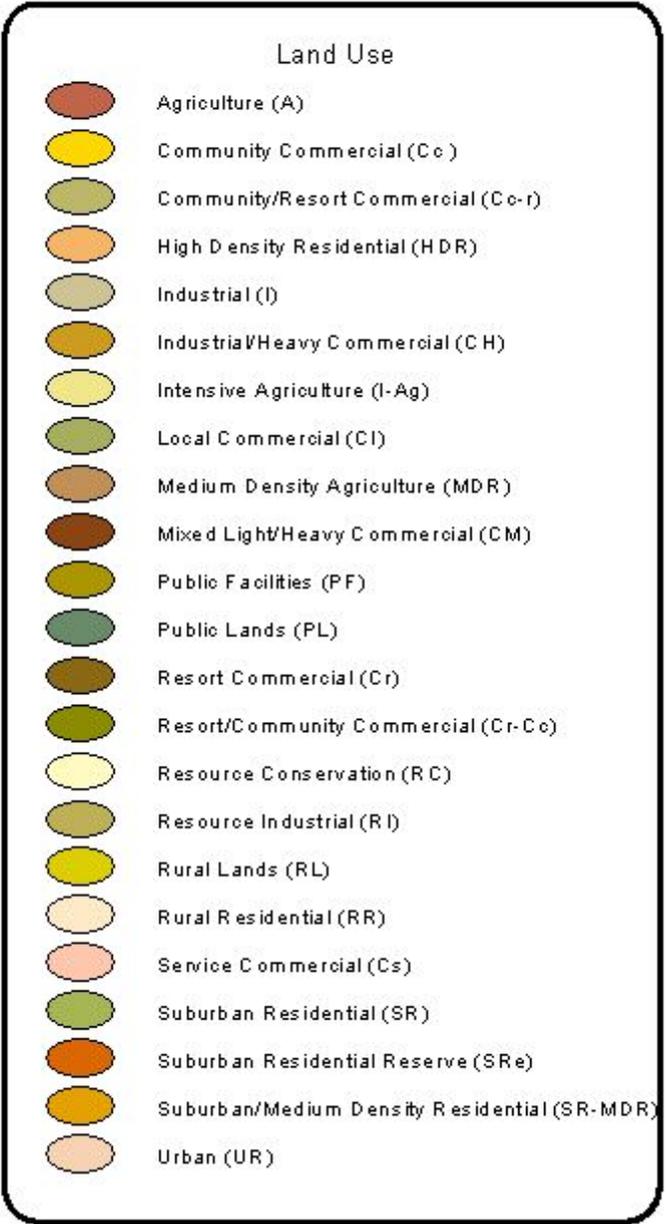
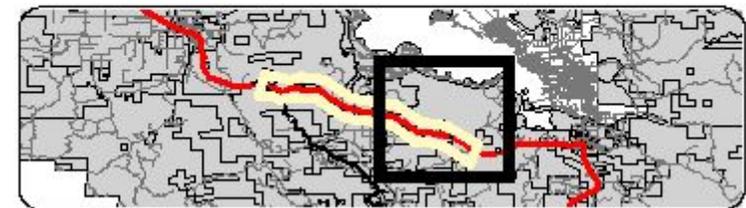


Figure 2.1-3 – Lake County
General Plan Land Use,
Eastern Project Area

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Lake 29 Improvement Project



2.1.2.3 Parks and Recreation

No parks are immediately adjacent to the proposed project corridor. The two parks in the general area of the project are described below.

Anderson Marsh State Historic Park

Anderson Marsh State Historic Park is located in Lower Lake near Clear Lake. This park features several miles of nature trails and interpretive displays and is adjacent to an Audubon Society wildlife sanctuary. The park is dedicated to the preservation of Clear Lake's marshes and the history of the Southeastern Pomo Native Americans.

Clear Lake State Park

Located north of Kelseyville on the southern shore of Clear Lake, Clear Lake State Park features four campgrounds and nearly 150 campsites. Fishing and swimming are permitted at this park, which also has a pair of hiking trails.

2.1.3 Impacts

2.1.3.1 Temporary and Construction Impacts

No Build Alternative

The No Build Alternative would not result in any temporary impacts on land use in the project area.

All Build Alternatives

Construction of the proposed improvements under the build alternatives would not affect land use patterns in the project area. No impact would occur.

2.1.3.2 Permanent Impacts

Impacts on Existing and Planned Land Uses

No Build Alternative

The No Build Alternative would not alter existing or future land uses in the project area.

All Build Alternatives

Alternatives C1, C2, and C3 would require between 290 and 350 acres of land adjacent to SR 29. Alternative C1 (which would not alter the existing roadway's centerline) would require the least amount of new right of way: approximately 288 acres. Alternative C2 (which would move the roadway's centerline approximately 30 feet to the north of the existing centerline) would require the acquisition of approximately 324 acres of adjacent land, and Alternative C3 (which would move the

roadway's centerline approximately 30 feet to the south of the existing centerline) would require the acquisition of approximately 350 acres of land. Alternative D would require the acquisition of approximately 322 acres of land.

Except for a few areas where the build alternatives would affect areas designated Resort Commercial or Local Commercial, most of the land that would be converted to highway use is designated for agricultural, rural land, or rural residential uses. The loss of agricultural lands is discussed at length in Section 2.3. The amount of land that would be converted from Rural Lands and Rural Residential lands to highway use is negligible compared to the overall acreage in the county zoned for these uses. There are well over 19,760 acres of designated Rural Lands and over 2,470 acres of Rural Residential lands within a 5-mile radius of the project area. The proposed project would affect less than 1 percent of the county's Rural Residential lands and less than 0.1 percent of the county's Rural Lands.

All of the build alternatives would affect some portion of the 54 acres of land at the SR 29/281/Red Hills Road intersection zoned for Resort Commercial use (located northwest, southwest, and southeast of the intersection). A grade-separated interchange (either the spread diamond or partial [two-quadrant] cloverleaf design) would require approximately 25 acres from this area and would dramatically change access to adjacent parcels. A signalized intersection would require between 13 and 20 acres from this area and would also result in access changes for adjacent parcels. The business displacement impacts of each alternative are discussed in Section 2.4.

There are many areas of local and community commercial use in the county. The conversion of land from commercial zoning to highway use would not substantially reduce the amount of land within the county that is available for commercial use.

Consistency with Local Plans and Policies

No Build Alternative

The No Build Alternative would not be consistent with local plans and policies, which support improvements to SR 29.

All Build Alternatives

All build alternatives are supported by the Lake County General Plan, which endorses a road network that accommodates projected growth in traffic volumes.

Consistent with Open Space, Conservation, and Recreation Goal 1, the project's encroachment into Manning Flat (one of the areas identified in the previous General Plan's critical resource mapping) is limited.

The Kelseyville Area Plan supports conversion of SR 29 to a four-lane facility. All build alternatives are also consistent with the Lower Lake Area Plan.

All build alternatives are consistent with the RTP and the *State Route 20 Corridor Study*, which recommend that SR 29 be converted to a four-lane freeway/expressway in the project area.

Impacts on Parks and Recreation

No Build Alternative

The No Build Alternative would not affect any parks or recreation areas in the project area.

All Build Alternatives

No public parks or recreation areas within the area would be affected by any of the build alternatives. No impact would occur.

2.1.4 Avoidance, Minimization, and Mitigation Measures

No avoidance, minimization, or mitigation measures are required.

2.2 Growth

2.2.1 Regulatory Setting

The Council on Environmental Quality (CEQ) regulations, which implement NEPA, require evaluation of the potential environmental consequences of all proposed federal activities and programs. This provision includes a requirement to examine indirect consequences, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The CEQ regulations (40 Code of Federal Regulations [CFR] 1508.8) refer to these consequences as secondary impacts. Secondary impacts may include changes in land use, economic vitality, and population density, all of which are elements of growth.

The California Environmental Quality Act (CEQA) also requires the analysis of a project's potential to induce growth. Section 15126.2(d) of the CEQA Guidelines requires that environmental documents "discuss the ways in which the proposed

project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.”

2.2.2 Growth Inducement Analysis

The Caltrans *Guidance for Preparers of Growth-related, Indirect Impact Analyses* (Caltrans 2006a) recommends the following six steps when assessing a project’s potential growth-inducing impacts:

- Step 1: Review previous project information and decide on the approach and level of effort needed for the analysis.
- Step 2: Identify the potential for growth for each alternative.
- Step 3: Assess the growth-related effects of each alternative to resources of concern.
- Step 4: Consider additional opportunities to avoid and minimize growth-related impacts.
- Step 5: Compare the results of the analysis for all alternatives.
- Step 6: Document the process and findings of the analysis.

2.2.2.1 Geographic Study Area

The study area for indirect and secondary impacts, including potential growth inducement, is made up of the area that would see the greatest improvements in accessibility as a result of the proposed project. The build alternatives are expected to result in a reduction of travel times along this portion of SR 29 of up to 4 minutes, compared to projected travel times with no improvement. This equates to an improvement in accessibility of about 5 miles. Figure 2.2-1 shows the area in which this accessibility improvement would have the greatest effect: the project corridor, and a radius of 5 miles. This encompasses the communities of Clear Lake Riviera, Kelseyville, and Lower Lake.

The proposed project would not substantially reduce the travel time between the communities in the project area and employment centers in adjacent counties. Kelseyville is approximately 60 miles from Napa (over 70 minutes of driving time). Lower Lake is approximately 50 miles from Ukiah (about an hour of driving time). The amount of time workers are willing to spend commuting is increasing as a result of rising housing costs, but the distance from the project area’s communities to nearby employment centers is nearly three times farther than median commute times in Napa and Sonoma counties (23 and 25 minutes, respectively, in 2005). At 60 miles



Study Area for Secondary Impacts
(5-mile radius)

Legend

-  Project Limits
-  State Highways
-  Study Area
-  Undeveloped Areas within County Growth Boundaries

FIGURE 2.2-1 – GEOGRAPHIC STUDY AREA FOR INDIRECT AND SECONDARY IMPACTS

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per hour, the commute between Lower Lake and Ukiah would be 1.8 times longer than the average commute for residents of Mendocino County.

The Wine Country Interregional Partnership's (IRP) report entitled *IRP Actions to Address Jobs-Housing Imbalance and Imbalance Impacts* includes a thorough examination of the effect of the low cost of housing in Lake County, relative to nearby counties, on regional commuting patterns. This report finds that the affordability of housing in Lake County is due to the fact that "Lake County has no travel route that makes the County accessible from any direction and by any mode" (IRP 2004). The report also finds that "if access were not a major impediment to residential development, Lake County would be a major recipient of workforce housing from [Napa, Sonoma, and Mendocino] counties." In spite of the difficulties in commuting between Lake County and adjacent counties to the west and south, the IRP's report projects that Lower Lake and Middletown will see increased development of housing for workers in Napa, Sonoma, and Mendocino counties.

While the build alternatives would improve accessibility within Lake County, the portion of SR 29 that limits the roadway's ability to connect Lake and Napa counties is just south of the Napa/Lake County line. The IRP's report identifies this portion as among the "segments with the worst terrain in the Wine Country roadway system." This segment is likely to act as a constraint on the number of commuters willing to travel between the project area and employment centers in Napa County.

2.2.2.2 Step 1: Methodology and Level of Effort

As the *Guidance for Preparers of Growth-related, Indirect Impact Analyses* (Caltrans 2006a) states, adding lanes to a highway "could cause growth-related impacts" because new lanes "add capacity to an existing facility. These projects warrant closer consideration to determine whether an analysis of growth-related impacts will be necessary."

The fact that the proposed project would be expected to reduce travel time suggests that a study of possible growth inducement is warranted.

Therefore, the methodology used is a qualitative analysis of factors contributing to and constraining growth in this area, and how the project would alter these opportunities and constraints. A combination of approaches, including the use of geographic information systems (GIS) software and traffic forecasts, is used to support this process of qualitative inference.

2.2.2.3 Step 2: Potential for Growth

The *Draft 2006 General Plan Goals and Policies Report* (Lake County 2006a) identifies growth boundary areas for Kelseyville, Lower Lake, and Clear Lake Riviera. Comparing the area inside these growth boundaries with the area identified as “urbanized” in the 2004 California Department of Conservation (CDC) farmland maps, these growth boundaries encompass a total area of approximately 1,700 acres, with the greatest room for growth identified in Lower Lake (approximately 750 acres).

Water resources are scarce in Lake County, and the need to demonstrate a supply of water as part of all development proposals (see Draft 2006 General Plan Water Resource Element, Policy 3.2) is likely to present a barrier to development.

No wastewater treatment other than by septic system is available in the areas between these communities, which presents a substantial obstacle to large-scale development. Additionally, Lake County’s open space and agricultural resources preservation policies do not favor the development of areas outside of existing communities. The greatest potential for growth, therefore, is adjacent to existing communities.

Housing Demand

Housing in Lake County is much more affordable than in nearby Mendocino, Napa, and Sonoma counties. According to data from the Wine Country Interregional Partnership, in 2002 Lake County was one of the few areas in the Wine Country in which housing was still affordable to households with only one full-time worker. In Mendocino, Napa, and Sonoma counties in 2002, the ratio of housing prices to average wages were such that—statistically—households needed more than two wage earners to afford a home.

This disparity in prices helped to drive population growth in Lake County between 2000 and 2006. Lake County added 5,700 residents in this period, for a growth rate of 9.9 percent, outpacing growth in Mendocino, Napa, and Sonoma counties, as well as the statewide rate of 9.7 percent.

Counterbalancing the demand for housing is Lake County’s relative inaccessibility. Barring major economic expansion in Lake County, the demand for housing there will continue to be linked to commuters’ willingness to accept commute times that are much longer than regional averages. Because the proposed project would have a marginal effect on these commute times, it may result in a minor improvement in the potential for growth in the study area.

2.2.2.4 Step 3: Growth-Related Effects and Resources of Concern

Based on the biological resources within the project's limits, it seems likely that any development in rural Lake County may affect wetlands or endangered species habitat. A complete survey of the resources within developable areas in a 5-mile radius of the project is not feasible. Lake County has established growth boundaries that are likely to have avoided well-known resource areas. For instance, the growth boundary for Kelseyville avoids the high-quality agricultural soils to the west of that community.

As developments are planned, they will undergo environmental review and will be required to mitigate for significant impacts to environmental resources.

2.2.2.5 Step 4: Consider Additional Opportunities to Avoid and Minimize Growth-Related Impacts

The proposed project would not be expected to result in development outside of the growth boundaries for Kelseyville, Lower Lake, and Clearlake Riviera, which are identified by Lake County in the *Draft 2006 General Plan Goals and Policies Report*. Growth within these boundaries that is consistent with the county's goals and policies would not be considered an adverse impact.

2.2.2.6 Step 5: Compare the Results of the Analysis for All Alternatives

The No Build Alternative would not improve travel time or affect development trends in the area.

All of the build alternatives would reduce travel times on SR 29 in the project limits by 3 to 4 minutes. All of the build alternatives would be likely to produce similar results in terms of increasing the attractiveness of communities in the study area to development.

2.2.2.7 Step 6: Process and Findings

Process

Traffic Information

The Caltrans Traffic Forecasting unit provided data on the reduction in travel time that would result from the proposed project.

Geographic Information Systems

GIS software was used to develop a study area for indirect and secondary impacts and to compare the existing urbanized area with the planned growth boundaries for the communities in the study area.

Planning Information

Lake County's *General Plan Background Report* and the *Draft 2006 General Plan Goals and Policies Report* served as the sources of information on growth trends, community service availability, and resource conservation policies. Additionally, Caltrans staff discussed the project's potential to stimulate growth with Lake County planners and other stakeholders.

The report *IRP Actions to Address Jobs-Housing Imbalance and Imbalance Impacts* (IRP 2004) provides a wealth of data on projected commuting patterns in this region and was used in preparing this analysis.

Assumptions Included in Analysis

Development will be directed toward existing communities. According to the Lake County Community Development Department, the county has avoided extending infrastructure into parts of the county such as the proposed project corridor, where large-scale, high-density development would be inconsistent with surrounding uses (see General Plan Update Land Use Policies 1.1, 2.1, and 2.6). This analysis assumes that the county's ability to control the location of infrastructure will continue to limit development outside of existing communities (i.e., Kelseyville, Lower Lake, and Clear Lake Riviera).

Findings

1. The proposed project would make the study area's communities more attractive to development, relative to other locations within the county, by improving safety and reducing travel time along SR 29. As a result, Lower Lake, Kelseyville, and Clear Lake Riviera would likely be considered for new development that would otherwise be developed near Lakeport or the other communities in Lake County. Additional growth along the project corridor outside of the established growth boundaries is not anticipated.
2. The project would make the study area communities (Kelseyville, Lower Lake, and Clear Lake Riviera) marginally more attractive to commuters working in Mendocino, Napa, and Sonoma counties. The two most important factors households are likely to consider when contemplating a move from one of these counties to the study area are housing cost and distance. In the case of workers based in Napa County, driving conditions on SR 29 in Napa County are also a factor.

The proposed project would improve accessibility on SR 29 in Lake County.

However, congestion on this portion of highway has not been identified as a constraint on development in this area. People working in Ukiah, for example, are unlikely to live in Clear Lake Riviera under current conditions because of the 1-hour (one-way) travel time. Very few households are likely to base the decision to relocate from Ukiah to Clear Lake Riviera based on a travel time reduction of 4 minutes. A relatively minor decrease in travel times would be associated with a relatively minor increase in development activity in the established urban development areas of Kelseyville, Lower Lake, and Clear Lake Riviera.

2.3 Farmlands

2.3.1 Regulatory Setting

The National Environmental Policy Act (NEPA) and the Farmland Protection Policy Act (7 United States Code [USC] 4201–4209; and its regulations, 7 CFR Part 658) require federal agencies, such as the Federal Highway Administration (FHWA), to coordinate with the Natural Resources Conservation Service (NRCS)¹⁵ if their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the Farmland Protection Policy Act, farmland includes prime farmland, unique farmland, and farmland of statewide or local importance.

CEQA requires the review of projects that would convert Williamson Act contract land to nonagricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to deter the early conversion of agricultural and open space lands to other uses.

2.3.2 Affected Environment

2.3.2.1 Farmlands in the Project Area

In 2004, approximately 1,300 of Lake County's workers were employed in the farming industry, nearly 6 percent of the workforce. Farm earnings in 2004 were about 3 percent of total earnings in the county. Statewide, Lake County's \$55.8 million in agricultural production represented less than 1 percent of total agricultural production.

¹⁵ The Natural Resources Conservation Service, formerly the Soil Conservation Service, is a federal agency that assists private land owners in the United States to conserve soil, water, and other natural resources.

According to the CDC, Lake County has 288,000 acres in agricultural uses (34 percent of the county), 240,000 acres of which are grazing land. In 2004, the county had 48,000 acres of “Important Farmland”; that is, farmland mapped in the categories of Prime, Statewide Importance, Unique, and Local Importance. Of this, 15,460 acres were considered Prime Farmland. According to the 2002 Census of Agriculture, Lake County has 880 farms in operation, primarily producing Bartlett pears and grapes. Between 1997 and 2000, grape production surpassed pear production in value. Lake County now has more than 10 wineries. In September 2004, the southwestern shore of Clear Lake was recognized by the federal Alcohol and Tobacco Tax and Trade Bureau as a distinct wine-growing region. Vineyards in this area have an official American Viticultural Area appellation: Red Hills of Lake County (see 27 CFR Section 9.169).

Much of the project area is undeveloped, vacant land. There is some nonagricultural development in the project area, including rural residences, an auto salvage yard, and a cluster of commercial uses near the SR 29/281/Red Hills Road intersection. Otherwise, the primary economic activity in the project area is agriculture. A small proportion of the project area has been zoned by Lake County in zoning categories for the protection of agricultural land. Lands designated for Intensive Agricultural and Agricultural uses are found adjacent to SR 29 in this area (see Figures 2.1-2 and 2.1-3 in Section 2.1). Agricultural activity in the project area consists primarily of vineyards and grazing areas. There are also pear and walnut orchards in the project area.

There are no Williamson Act properties adjacent to SR 29 in the project area.

2.3.2.2 Project Area Farmland Ratings

The NRCS uses the Storie Index to rate the value of soils in a given area. By placing a value (Prime, Unique, Statewide/Local Importance, etc.) on the agricultural potential of soils in an area, NRCS can evaluate the potential impacts of the conversion of land to uses other than farmland.

The Storie Index rates soils accordingly to their ability to sustain intensive agricultural use. This index uses physical characteristics such as permeability, water retention capability, soil depth, soil texture, and surface relief to rate the soil. The rating scale ranges between 0 and 100. A rating of between 80 and 100 usually indicates Prime Farmland.

The Storie Index does not take into account the availability of irrigation water, local climate, and other critical factors, which would affect the type of commercial plant

crops that thrive in a certain locale. Due to its one-dimensional rating method, the Storie Index is not a stand-alone index to rate land value. However, the Storie Index does lend itself to providing a quantitative value to land's productive potential, regardless of the current use of the area.

The project area contains approximately 70 acres of Prime Farmland, 349 acres of Unique Farmland, 100 acres of Farmland of Statewide Importance, and 277 acres of Farmland of Local Importance. The rest of the project area is classified as Grazing Land. Figure 2.3-1 shows the locations of the farmland types in the project area.

2.3.3 Impacts

2.3.3.1 Temporary and Construction Impacts

No Build Alternative

The No Build Alternative would not involve any new construction; therefore, no temporary impacts to agricultural resources or farmland would occur.

All Build Alternatives

Farm equipment and agricultural products hauled on SR 29 would encounter traffic controls during construction. However, the duration of traffic controls would be short term and would not likely have substantial adverse impacts on agricultural operations in this area.

2.3.3.2 Permanent Impacts

Farmland Conversion

No Build Alternative

The No Build Alternative would not convert any farmland to highway use. No impact would occur.

All Build Alternatives

Table 2.3-1 shows the number of acres of designated farmland by type that would be converted to highway use by each of the build alternatives. As this table shows, all of the build alternatives would convert between approximately 390 and 450 acres of designated farmland to highway land use.

All of the build alternatives would convert similar quantities of Prime and Unique Farmland: on the order of 5.5 acres. This amounts to less than one-tenth of a percent of Lake County's important (nongrazing) farmland. The fourth column of Table 2.3-1 shows the rating that NRCS assigned to the farmland in question. On a scale of 0 to 100,

NRCS has rated most of this farmland at 40, indicating that, while there are Prime soils in the area, most of the project area consists of relatively poor-quality soils.

Table 2.3-1 Farmland Conversion by Build Alternative¹

Alternatives	Land Converted (acres)	Prime and Unique Farmland (acres)	Farmland of Statewide/ Local Importance (acres)	Percent of Farmland ² (County)	Relative Value of Farmland (Storie Index)
C1	387	5.5	49.9	0.12%	40.3
C2	423	5.5	50	0.12%	40.3
C3	446	5.5	51	0.12%	40.2
D	322	5.5	50	0.12%	40.3

Source: Form AD-1006 (Farmland Conversion Impact Rating)

¹ Farmland conversion totals by alternative exceed right of way acquisition totals by alternative due to the presumed indirect conversion of a limited number of farmlands not actually acquired for the project.

² "Farmland" refers to the "important farmland" categories used by the CDC: Prime Farmland, Unique Farmland, Farmland of Statewide Importance, and Farmland of Local Importance. In 2004, there were 48,000 acres of "important farmland" in Lake County.

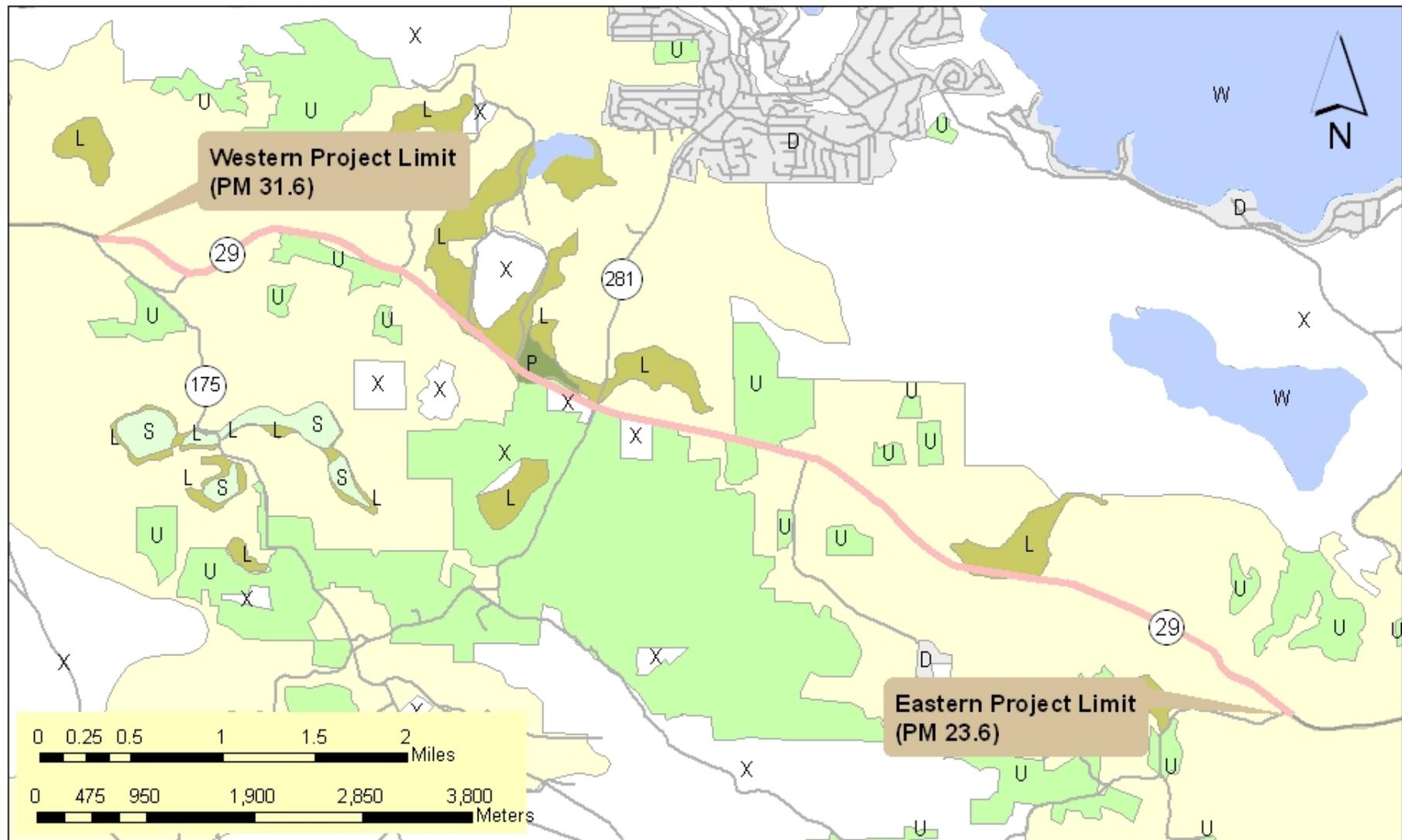
The Farmland Protection and Policy Act requires that a Farmland Conversion Impact Rating (Form AD 1006) be completed to identify the potential for a project to have adverse effects on agricultural lands. According to the act, alternatives that score above the United States Department of Agriculture (USDA) 160-point threshold are considered to have a substantial adverse impact. According to the Land Evaluation and Site Assessment, all of the build alternatives score well below the USDA 160-point threshold. Therefore, while agricultural resources in the project area would be affected as a result of the proposed project, the level of impact would not be substantial relative to overall agricultural activity in this area.

Table 2.3-2 summarizes the Farmland Conversion Impact Rating forms. The completed Farmland Conversion Impact Rating forms are shown in Figures 2.3-2A (for Alternatives C1, C2, and C3) and 2.3-2B (for Alternative D).

Table 2.3-2 Farmland Site Assessment

Alternatives	Land Converted (acres)	Relative Value of Farmland (Part V)	Total Site Assessment (Part VI)	Total
C1	387	40.3	79	119.3
C2	423	40.3	79	119.3
C3	446	40.2	79	119.2
D	322	40.3	54	94.3

Source: Form AD-1006 (Farmland Conversion Impact Rating)



Legend

- | | |
|----------------------|--------------------------|
| D - Urbanized | S - Statewide Importance |
| G - Grazing | U - Unique Farmland |
| L - Local Importance | W - Water |
| P - Prime Farmland | X - Unclassified |

FIGURE 2.3-1 FARMLAND TYPES
IN THE PROJECT AREA

01-LAK-29
PM 23.6/31.6
EA 2981U0
Lake 29 Improvement Project

U.S. Department of Agriculture
FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request AUGUST 8, 2002			
Name Of Project ROUTE 29 UPGRADE PROJECT		Federal Agency Involved FHWA			
Proposed Land Use ROADWAY		County And State LAKE COUNTY, CA			
PART II (To be completed by NRCS)		Date Request Received By NRCS 8/19/02 LwK			
Does the site contain prime, unique, statewide or local important farmland? (If no, the FPPA does not apply -- do not complete additional parts of this form)		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Acres Irrigated	Average Farm Size
Major Crop(s) Grapes, Peaches, & Walnuts		Farmable Land In Govt. Jurisdiction Acres: 29700 % 3		16,700	186
Name Of Land Evaluation System Used California - State System		Name Of Local Site Assessment System None		Amount Of Farmland As Defined In FPPA Acres: 16700 % 2	
				Date Land Evaluation Returned By NRCS 9/17/02 LwK	
PART III (To be completed by Federal Agency)		Alternative Site Rating			
		Alt. C1	Alt. C2	Alt. C3	Passing Lanes
A. Total Acres To Be Converted Directly		288	324	347	288
B. Total Acres To Be Converted Indirectly		99	99	99	99
C. Total Acres In Site		387	423	446	387
PART IV (To be completed by NRCS) Land Evaluation Information					
A. Total Acres Prime And Unique Farmland		5.5	5.5	5.5	2.5
B. Total Acres Statewide And Local Important Farmland		49.9	50	51	49.5
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted		0	0	0	0
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value		0	0	0	0
PART V (To be completed by NRCS) Land Evaluation Criterion					
Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)		40.3	40.3	40.2	38
PART VI (To be completed by Federal Agency)					
Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))		Maximum Points			
1. Area In Nonurban Use		15	15	15	15
2. Perimeter In Nonurban Use		10	10	10	10
3. Percent Of Site Being Farmed		20	2	2	2
4. Protection Provided By State And Local Government		20	5	5	5
5. Distance From Urban Builtup Area		N/A			
6. Distance To Urban Support Services		N/A			
7. Size Of Present Farm Unit Compared To Average		10	3	3	3
8. Creation Of Nonfarmable Farmland		35	25	25	25
9. Availability Of Farm Support Services		5	2	2	2
10. On-Farm Investments		20	7	7	7
11. Effects Of Conversion On Farm Support Services		25	3	3	3
12. Compatibility With Existing Agricultural Use		10	5	5	5
TOTAL SITE ASSESSMENT POINTS		160	79	79	79
PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland (From Part V) 100		100	40.3	40.2	38
Total Site Assessment (From Part VI above or a local site assessment)		160	79	79	79
TOTAL POINTS (Total of above 2 lines)		260	119.3	119.2	117
Site Selected:		Date Of Selection	Was A Local Site Assessment Used? Yes <input type="checkbox"/> No <input type="checkbox"/>		
Reason For Selection:					

26815174

Lake 29 Improvement Project

Farmland Conversion Impact Rating Form,
 Alternatives C1, C2, and C3

Figure
 2.3-2A

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I (To be completed by Federal Agency) 3. Date Of Land Evaluation Request: 2/2/07 4. Sheet 1 of 1

1. Name of Project: ROUTE 29 UPGRADE PROJECT 5. Federal Agency Involved: FHWA
2. Proposed Land Use: ROADWAY 6. County and State: LAKE COUNTY, CA

PART II (To be completed by NRCS) 1. Date Request Received By NRCS 2. Person Completing Form:

3. Does the corridor contain prime, unique, statewide or local important farmland? (If no, the FPPA does not apply - do not complete additional parts of this form) YES NO
4. Acres Irrigated: 16700 Average Farm Size: 186

5. Major Crop(s): Grapes Walnuts Pears 6. Farmable Land In Government Jurisdiction: Acres: 29700 % 3 7. Amount of Farmland As Defined in FPPA: Acres: 16200 % 2

8. Name of Land Evaluation System Used: California Storie System 9. Name of State or Local Site Assessment System: None 10. Date Land Evaluation Returned by NRCS: 3/5/07 LRO

PART III (To be completed by Federal Agency)

Alternative Corridor For Segment				
Corridor A	Corridor B	Corridor C	Corridor D	
A. Total Acres To Be Converted Directly	<u>897</u>			
B. Total Acres To Be Converted Indirectly	<u>25</u>			
C. Total Acres In Site	<u>322</u>			

PART IV (To be completed by NRCS) Land Evaluation Information

A. Total Acres Prime And Unique Farmland	<u>5.5</u>			
B. Total Acres Statewide Important or Local Important Farmland	<u>50</u>			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	<u>0</u>			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	<u>0</u>			

PART V (To be completed by NRCS) Land Evaluation Criterion
Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points): 40.3

PART VI (To be completed by Federal Agency) Corridor Assessment Criteria (Criteria are explained in 7 CFR 658.5 b & c. For Non-Corridor project use form AD-1006)

	Maximum Points	Corridor A	Corridor B	Corridor C	Corridor D
1. Area In Non-urban Use (15)	<u>15</u>				
2. Perimeter In Non-urban Use (10)	<u>10</u>				
3. Percent Of Corridor Being Farmed (20)	<u>0</u>				
4. Protection Provided By State and Local Government (20)	<u>0</u>				
5. Size Of Present Farm Unit Compared To Average (10)	<u>3</u>				
6. Creation Of Non-farmable Farmland (25)	<u>5.75</u>				
7. Availability Of Farm Support Services (5)	<u>5</u>				
8. On-Farm Investments (20)	<u>10</u>				
9. Effects Of Conversion On Farm Support Services (25)	<u>0</u>				
10. Compatibility With Existing Agricultural Use (10)	<u>0</u>				
TOTAL CORRIDOR ASSESSMENT POINTS (160)	<u>54</u>				

PART VII (To be completed by Federal Agency)

Relative Value Of Farmland (From Part V)	100	<u>40.3</u>			
Total Corridor Assessment (From Part VI above or local site assessment)	160	<u>54</u>			
TOTAL POINTS (Total of above 2 lines)	260	<u>94.3</u>			

1. Corridor Selected: 2. Total Acres of Farmlands to be Converted by Project: 3. Date Of Selection: 4. Was A Local Site Assessment Used? YES NO

5. Reason For Selection:

Name of Federal agency representative completing this form: _____ Date: _____

NOTE: Complete one form for each segment with more than one Alternate Corridor (See instructions on reverse side) Form NRCS-CPA-106 (03-02)

Williamson Act Parcels

No Build Alternative

The No Build Alternative would not convert any farmland to highway use. No impact would occur.

All Build Alternatives

None of the farmland in the project area has been included in the Williamson Act program. The build alternatives would have no impact on Williamson Act parcels.

Indirect Conversion

No Build Alternative

The No Build Alternative would not make any improvements to the highway. There would be no indirect conversion impact.

All Build Alternatives

All of the build alternatives would convert an existing two-lane highway to a four-lane, access-controlled expressway. A reduction in the number of access points will lead to changes in the way properties are accessed. This may lead to difficulties for property owners who have traditionally used available at-grade crossings for agricultural operations. This, in turn, could lead to the conversion of some agricultural land to nonagricultural uses.

2.3.4 Avoidance, Minimization, and Mitigation Measures

No avoidance, minimization, or mitigation is required.

2.4 Community Impacts

2.4.1 Regulatory Setting

2.4.1.1 Community Cohesion

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

Under CEQA, an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant. Since this project would result in physical change to the environment, it is appropriate to consider changes to community cohesion in assessing the significance of the project's effects.

2.4.1.2 Relocations

The Caltrans Relocation Assistance Program is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 CFR Part 24. The purpose of the Relocation Assistance Program is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably and do not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. The Relocation Assistance Program is summarized in Appendix C.

All relocation services and benefits are administered without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 USC Section 2000d et seq.) (see Appendix D).

2.4.1.3 Environmental Justice

All projects involving a federal action (funding, permit, or land) must comply with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This Executive Order directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. "Low income" is defined based on the Department of Health and Human Services poverty guidelines. For 2007, this was \$20,650 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. Caltrans' Title VI Policy Statement is included in Appendix D.

2.4.2 Affected Environment

The population and demographic data in the following sections are primarily from the 1990 and 2000 U.S. Census decennial surveys. At the project study area level (the

Census block group level) and for unincorporated communities (such as Lower Lake and Kelseyville), the 2000 Census provides the most up-to-date information available. For Lake County and the state of California, additional information is available from the 2005 ACS and from the California Department of Finance. These data are provided where available to help identify Lake County’s demographic trends.

2.4.2.1 Population

Lake County

Prior to the 1950s, Lake County’s population increased slowly. In the population and construction boom of the 1950s, Lake County gained 3,400 residents, and population continued to increase steadily until the 1980s. In the 1980s, Lake County’s population nearly doubled with the addition of over 16,000 residents. In the 1990s, the county’s population increased by 40 percent. As of 2000, the county’s total population was approximately 58,000 (Table 2.4-1). Between 2000 and 2006, Lake County gained nearly 5,800 residents, for a growth rate of 9.9 percent. Statewide, population growth was comparable at 9.7 percent (California Department of Finance 2006).

Table 2.4-1 Population

		Project Area	Lake County	Lower Lake	Kelseyville
Population	2000	6,585	58,309	1,755	2,928
	2006	NA	64,105	NA	NA

Source: 2000 U.S. Census; California Department of Finance (2006 data).
NA = Not available

The *General Plan Background Report* prepared in support of Lake County’s General Plan Update used California Department of Finance population projections for the year 2020. Based on this data, Lake County is projected to have 93,000 residents in 2020.

Project Area Population

The project area falls within four Census Block Groups, which include a large geographic area and a population larger than either that of Kelseyville or Lower Lake. The combined population of these Census Block Groups was 6,585 in 2000, which is about 11 percent of Lake County’s population (Table 2.4-2). The project area itself, however, is sparsely populated. Most of the project area’s residents live north of SR 29 near Clear Lake.

Table 2.4-2 Project Area Census Blocks

Census Block	Abbreviation	Population
Census Tract 9, Block Group 1	Tract 9 BG1	2,349
Census Tract 9, Block Group 3	Tract 9 BG3	1,662
Census Tract 11, Block Group 1	Tract 11 BG1	1,685
Census Tract 12, Block Group 2	Tract 12 BG2	889

Source: 2000 U.S. Census

The proposed project would be located on a portion of SR 29 on the south side of Clear Lake between two small, unincorporated communities: Kelseyville and Lower Lake. In the year 2000, the U.S. Census reported the populations of these communities as 2,928 and 1,755, respectively. Kelseyville's population increased by 2.3 percent (from 2,861 to nearly 3,000 residents) in the 1990s. According to the Kelseyville Area Plan, growth in Kelseyville is expected to be "limited by physical factors such as topography, prime agricultural soils, and commuting distance to urban areas" (Lake County 1995, 2–5). At the time of the adoption of the Kelseyville Area Plan (1995), this community was expected to reach a 2010 population of 4,477. While population estimates for Kelseyville are not available for the period since the 2000 Census, there is no indication that its population has seen an increase of this magnitude. Similar projections are not available for Lower Lake.

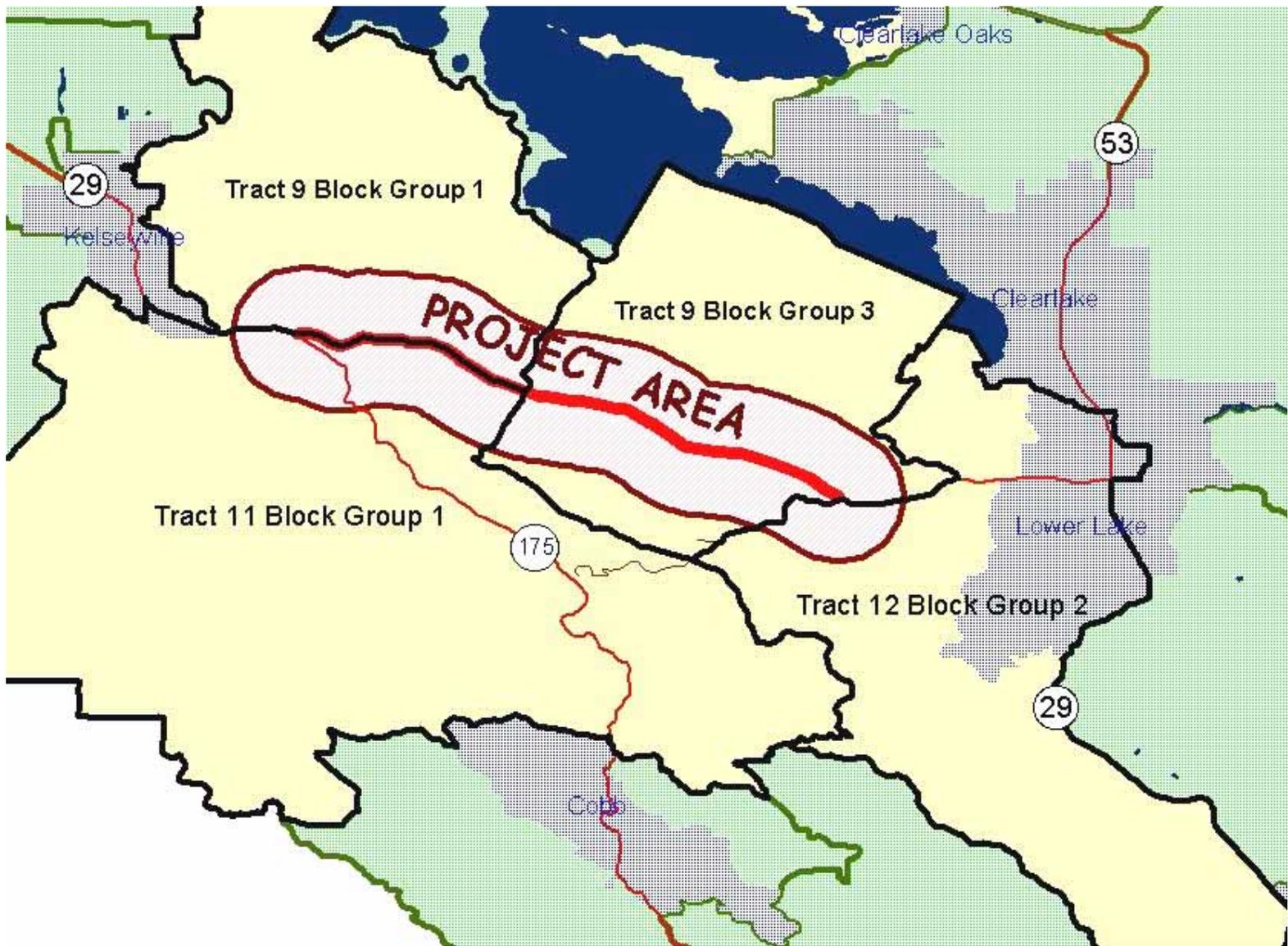
Project Area Demographic Characteristics

The project's direct impacts (such as residential and business displacement, construction noise, and permanent changes in access) would affect residents of the SR 29 area in the project area. This includes the residents of the four Census Block Groups listed in Table 2.4-2 and shown in Figure 2.4-1.

Age

At the time of the 2000 Census, the median age in Lake County was 42.7, compared to 33.3 in California as a whole. Compared to Lake County, California has a higher proportion of residents in the 35 to 44 age group, and a much higher proportion of residents in the 25 to 34 age group. Lake County, on the other hand, has higher proportions of residents age 55 and over than the state as a whole. At the time of the 2005 ACS, the median age in Lake County was 42.8, compared to 34.4 statewide.

The distribution of ages in the project area and the two communities on either side of the project area essentially mirrors that of Lake County as a whole. The project area



**FIGURE 2.4-1 – PROJECT AREA
BLOCK GROUPS**

01-LAK-29
PM 23.6/31.6
EA 2981U0
Lake 29 Improvement Project



has a higher proportion of residents in the 45 to 54 age group than in the county. The median age in the project area was 42.3 years in 2000. In Lower Lake, the median age was 43; in Kelseyville, the median age was 37 years.

Households

According to the 2000 Census, the average household size countywide was 2.40 people, compared to 2.87 statewide. By 2005, average household size had increased slightly to 2.48 people in Lake County and 2.92 people statewide. In Lake County, 64 percent of all households were “family” households; the U.S. Census defines family households as related individuals residing in a housing unit. In California, 69 percent of all households were family households.

There were 2,700 households in the project area in 2000, or approximately 11 percent of the nearly 24,000 households in the county. About 68 percent of these were family households. Approximately 60 percent of all households (family and nonfamily) in the project area were two-person households.

The U.S. Census defines a “householder” as the member of a household who lives at a housing unit and owns, is buying, or rents the housing unit. The proportion of householders 65 or older tends to be higher in Lake County (32 percent) than statewide (20 percent). In the project area, 28 percent of householders were 65 or older, compared to 26 percent in Kelseyville, and 32 percent in Lower Lake.

Race and Ethnicity

The racial composition of the county and the project area is generally less diverse than that of the state as a whole. At the time of the 2000 Census, over 90 percent of the residents of the project area and 86 percent of the residents of Lake County were white, compared to 60 percent of all Californians. No major shift in the county’s racial composition occurred between the 2000 Census and the 2005 ACS (Table 2.4-3).

In Kelseyville and Lower Lake, white residents made up more than three-quarters of the population. The largest categories of nonwhite residents were “Other” (which made up a relatively large proportion of responses in Kelseyville), American Indian/Alaska Native (which varied between 2 and 3 percent), and members of two or more races. More than 100 people identified themselves as American Indians or Alaska Natives in the project area, and more than 100 people identified themselves as belonging to a race other than the five major categories. Additionally, 4 percent of residents identified themselves as members of two or more races.

Table 2.4-3 Racial Composition

Category	Project Area		Lower Lake		Kelseyville		Lake County				CA	
	2000		2000		2000		2000		2005		2000	2005
One Race	6,348	96%	1,664	95%	2,789	95%	56,267	96%	61,599	96%	95%	97%
White	6,048	92%	1,482	84%	2,254	77%	50,289	86%	56,026	88%	60%	61%
Black or African American	71	1%	30	2%	4	0%	1,233	2%	1,435	2%	7%	6%
American Indian or Alaska Native	110	2%	36	2%	78	3%	1,772	3%	1,562	2%	1%	1%
Asian	10	0%	11	1%	26	1%	482	1%	161	0%	11%	12%
Native Hawaiian and Other Pacific Islander	-	0%	7	0%	-	0%	93	0%	0	0%	0%	0%
Some Other Race	109	2%	98	6%	427	15%	2,389	4%	2,415	4%	17%	16%
Two or More Races	237	4%	91	5%	139	5%	2,042	4%	2,363	4%	5%	3%
Total	6,585	100%	1,755	100%	2,928	100%	58,309	100%	63,962	100%	100%	100%

Source: 2000 U.S. Census; 2005 ACS

Note: Percentage totals may be greater or less than 100 percent due to rounding.

Hispanic or Latino Population

Statewide, a third of the population was Hispanic in 2000, compared to 10 percent of Lake County’s population. In 2005, Hispanics made up 35.5 percent of the statewide population and 14.6 percent of the county population. In the project area, approximately 8 percent of residents identified themselves as being of Hispanic or Latino origin at the time of the 2000 U.S. Census. This is slightly lower than in Lower Lake to the east, where 11 percent of the population is Hispanic, and much lower than Kelseyville to the west, where nearly 30 percent of the population is Hispanic.

Income

Incomes are lower in Lake County and its communities than in California as a whole, but income levels increased at similar rates in Lake County (about 34 percent) and the rest of the state (about 33 percent) between 1990 and 2000. According to the 2005 ACS, median household income in Lake County increased by 37 percent between 2000 and 2005 (although this may be due to ACS’ sampling and surveying methodology). Statewide, median household income increased 13 percent. Household income increased at similar rates in Lower Lake and Kelseyville in this period (Table 2.4-4).

Table 2.4-4 Income in Surrounding Areas

	1990	2000	Percent Change (1990–2000)	2005 ACS
Median Household Income				
Lower Lake	\$18,679	\$24,974	34%	N/A
Kelseyville	\$18,568	\$24,363	31%	N/A
Lake County	\$21,794	\$29,267	34%	\$40,067
California	\$35,798	\$47,493	33%	\$53,629
Per Capita Income				
Lower Lake	\$10,703	\$13,516	26%	N/A
Kelseyville	\$10,055	\$15,651	56%	N/A
Lake County	\$11,705	\$16,825	44%	\$19,046
California	\$16,409	\$22,711	38%	\$26,800

Source: 1990 Census; 2000 US Census; 2005 ACS

Median household income in the project area was lower than in California as a whole but substantially higher than in Lake County, Lower Lake, or Kelseyville. Median household income in 2000 ranged from nearly \$31,000 in Tract 12, Block Group 2 to nearly \$43,500 in Tract 9, Block Group 3 (Table 2.4-5).

Table 2.4-5 Project Area Income

Median Household Income		Tract 9 BG1	Tract 9 BG3	Tract 11 BG1	Tract 12 BG2
		\$40,164	\$43,448	\$37,639	\$30,833
% Households	Self-Employment Income	10%	16%	19%	15%
	Retirement Income	24%	33%	17%	14%
	Public Assistance Income	2%	5%	3%	6%
	Social Security Income	38%	38%	23%	35%
Per Capita Income		\$21,373	\$23,485	\$22,462	\$17,188

Source: 2000 U.S. Census

Per capita income in the project area was also higher than in surrounding areas or the county. Per capita income in three of the four Block Groups was on par with the year 2000 statewide per capita income of approximately \$22,700. Block Group 2 in Tract 12 was the exception, where the per capita income in 2000 was just over \$17,000. This income level, however, was higher than the per capita income in either the county, Lower Lake, or Kelseyville.

Poverty

At the time of the 2000 Census, the poverty threshold for a family of four was an income of \$17,050 or less. As seen in Table 2.4-5, the median household income in the project area was well above this level in the year 2000, suggesting that the local poverty rate is low.

At the time of the 2000 Census, the statewide poverty level for individuals was 14.2 percent. In Lake County, it was 17.6 percent. At the time of the 2005 ACS, the statewide poverty rate had fallen to 13.3 percent, while in Lake County it increased to 20.1 percent.

In the year 2000, Lower Lake's poverty rate was slightly below the state rate at 12.4 percent. Kelseyville's poverty rate was slightly higher than the state rate at 15.3 percent.

In the project area, the poverty rate for individuals varied between a high of 12.5 percent in Tract 11, Block Group 1 and a low of 5.2 percent in Tract 9, Block Group 3. Overall, the poverty rate for individuals in the project area was 10.4 percent. Five percent of the project area's families were living in poverty in 2000, compared to 13 percent in Lake County and 10.6 percent in California.

Housing

Lake County's housing stock expanded by 1,100 units between 2000 and 2005, a 3 percent increase. No major developments were added to the project area, suggesting that year 2000 data on housing stock are still valid for this area. However, since the 2000 Census, housing values have increased dramatically statewide. The 2005 ACS estimates that the median home value in Lake County was \$255,300, a 108 percent increase over the year 2000 median value of \$122,600. This suggests that year 2000 housing value data specific to the project area may have limited value, however, the year 2000 Census represents the most recent information available on property values at the project level.

There were 3,600 housing units in the project area in 2000, approximately 11 percent of the county's housing supply. Eighty percent of the housing units in the project area are single-family detached units, compared with 62 percent of the units countywide and 56 percent of all housing units statewide. The second-largest source of housing in the project area is in mobile homes, which made up 16 percent of the housing stock in the project area. Mobile homes are much more common in Lake County than in

general in California. Thirty percent of the county’s housing is in mobile homes, compared to 4 percent statewide (Table 2.4-6).

Table 2.4-6 Housing Vacancy Levels and Housing Types by Area

Category	Project Area		Lake County		Lower Lake		Kelseyville		CA	
	Number	%	Number	%	Number	%	Number	%	Number	%
Total Housing Units	3,615	100	32,528	100	893	100	1,175	100	12,214,549	100
Vacant	968	27	8,554	26	153	17	80	7	711,679	6
Vacant: Seasonal, Recreational, or Occasional Use	823	23	5,479	17	71	8	18	2	236,857	2
Owner-Occupied	2,012	76	16,914	71	546	61	712	61	6,546,334	57
Renter-Occupied	635	24	7,060	29	170	19	383	33	4,956,536	43
Single-Family Residence (Detached)	2,874	80	20,067	62	396	44	610	50	6,883,493	56
Single-Family Residence (Attached)	17	0	533	2	0	0	0	0	931,873	8
Duplex	93	3	438	1	7	1	11	1	327,024	3
Multiple-Family Residence	9	0	1,264	4	17	2	69	6	3,502,491	29
Mobile Home	595	16	9,752	30	461	52	521	43	538,423	4
Median Rent	N/A		\$567		\$650		\$577		\$747	
Median Value of Occupied Homes	N/A		\$122,600		\$116,800		\$122,200		\$211,500	

Source: 2000 US Census

Note: For housing costs by Block Group in the project area, see Table 2.4-7.

The project area’s vacancy rate in 2000 was 27 percent—high relative to California’s rate of 6 percent, but normal in the context of Lake County’s rate of 26 percent. This vacancy level reflects the area’s popularity as a vacation destination. Most vacant housing units in both the project area and the county are vacation homes and are not occupied for the full year. Vacancy rates were lower in both Lower Lake and Kelseyville than in the project area or the county. Vacation homes accounted for 8 percent of Lower Lake’s housing stock and 2 percent of Kelseyville’s, indicating that these communities are not as popular as other parts of the county as vacation destinations.

Rental units accounted for one in four housing units in the project area. In Kelseyville and Lake County as a whole, the proportion of rental housing was higher than in the project area (Table 2.4-6).

Given the more than 100 percent increase in housing values in Lake County between 2000 and 2005, year 2000 housing value information for the project area is unlikely

be accurate. However, Table 2.4-7 presents the year 2000 data to provide a sense of the pattern of property values in the area.

Table 2.4-7 Project Area Housing Costs

Category		Tract 9 BG1	Tract 9 BG3	Tract 11 BG1	Tract 12 BG2
Median Housing Costs	All Owner-Occupied Housing Units	\$ 122,300	\$ 126,300	\$ 134,900	\$ 94,600
	Mobile Homes	\$ 33,800	\$ 126,600	\$ 84,800	\$ 60,900
	Gross Rent	\$ 628	\$ 717	\$ 782	\$ 625
	Price Asked for Vacant-for-sale Units	\$ 177,500	\$ 112,500	\$ 97,500	\$ 71,300
Median Rent as a Percentage of Household Income		31%	22%	33%	18%

Source: 2000 U.S. Census

Median housing costs in the project area at the time of the 2000 Census were generally on par with costs in the rest of Lake County. Tract 11, Block Group 1, had the highest median value for owner-occupied homes in the project area: \$134,900. The median home value in Tract 9, Block Group 1, \$122,300, was on par with the countywide median. The median in Tract 9, Block Group 3 was slightly higher than the countywide median. Tract 12, Block Group 2, located south of SR 29, had the lowest median home value in the project area: \$94,600.

Median gross rent in Lake County in 2000 was \$570. Median rent throughout the project area was above this level, reaching a high of \$782 in Tract 11, Block Group 1. According to the United States Department of Housing and Urban Development, when monthly housing costs are at or below one-third of monthly income, housing is affordably priced. In the project area, rents were generally at or below this level in the year 2000.

2.4.2.2 Community Cohesion

Community cohesion is the degree to which residents have a “sense of belonging” to their neighborhood; a level of commitment of the residents to the community; or a strong attachment to neighbors, groups, and institutions, usually as a result of continued association over time. Cohesion also refers to the degree of interaction among the individuals, groups, and institutions that make up a community. The project area is sparsely populated and is more likely to be perceived as an area belonging in some sense to each of the three nearest communities: Kelseyville, Lower Lake, and Clear Lake Riviera. There are no clusters of residences in the project area.

2.4.2.3 Community Attitudes

Informal personal interviews conducted during fieldwork and project planning indicated that many of the residents of the proposed project area believe that the project is needed because of recent past growth and predicted future growth. Several people in the area stated that improvements were particularly needed for the intersection of SR 29/281/Red Hills Road, which is perceived as having a relatively high number of accidents.

There is a perception that high housing costs in communities south and west of the project area—in Sonoma and Napa counties—are forcing people who work in these counties to move to Lake County. The resulting growth is seen as creating congestion and dangerous conditions on SR 29.

2.4.2.4 Employment

According to the California Employment Development Department, 13,500 people were employed in Lake County in 2007. While Clearlake is the larger of the two cities in Lake County, with a population of more than 13,000, more of the large employers in the county are located in Lakeport, on the western side of Clear Lake. Only one major employer is located in Middletown, in the southeastern part of the county.

The biggest source of employment in Lake County and in the project area is in services. Approximately half of the workforce at both the county and project area levels was employed in one of the categories of services at the time of the 2000 U.S. Census. Manufacturing makes up a relatively small segment of the county's economy. Other major industrial categories were construction (which employed approximately a tenth of the workforce), retail trade, and public administration.

2.4.2.5 Project Area Businesses

Figure 2.4-2 shows the locations of businesses in the project area.

Konocti Harbor

The largest employer in the general vicinity of the project area is Konocti Harbor Resort and Spa. Konocti Harbor employs an estimated 250 workers, making it among the largest employers in the county. Konocti Harbor is situated on 120 acres on the south shore of Clear Lake, less than 5 miles north of SR 29 at 8727 SR 281 (Soda Bay Road). Resort facilities include 250 rooms, an indoor concert theater with seating for 1,000, an outdoor amphitheater with seating for 5,000, a boat ramp, several tennis

courts, and a restaurant. Concerts are held at this resort throughout the year, drawing concertgoers from throughout the region.

Kit's Corner

Kit's Corner is located at the northwest corner of the SR 29/281/Red Hills Road intersection. Kit's Corner was established in 1976 as a truck stop, gas station, and convenience facility to serve truck traffic on SR 29. Kit's Corner provides an array of services to both residents and through traffic. A single large structure on this corner houses several small shops including a convenience store/gas station (also offering video rentals), a barber shop, a dog grooming shop, a gift shop, and a hair salon. Creekside Lodge, a moderately priced 14-room motel, is also located on this corner. The convenience store and hotel employ approximately 16 people in total. The five smaller shops each employ between one and three people each. A small used vehicle sales lot also exists on the property.

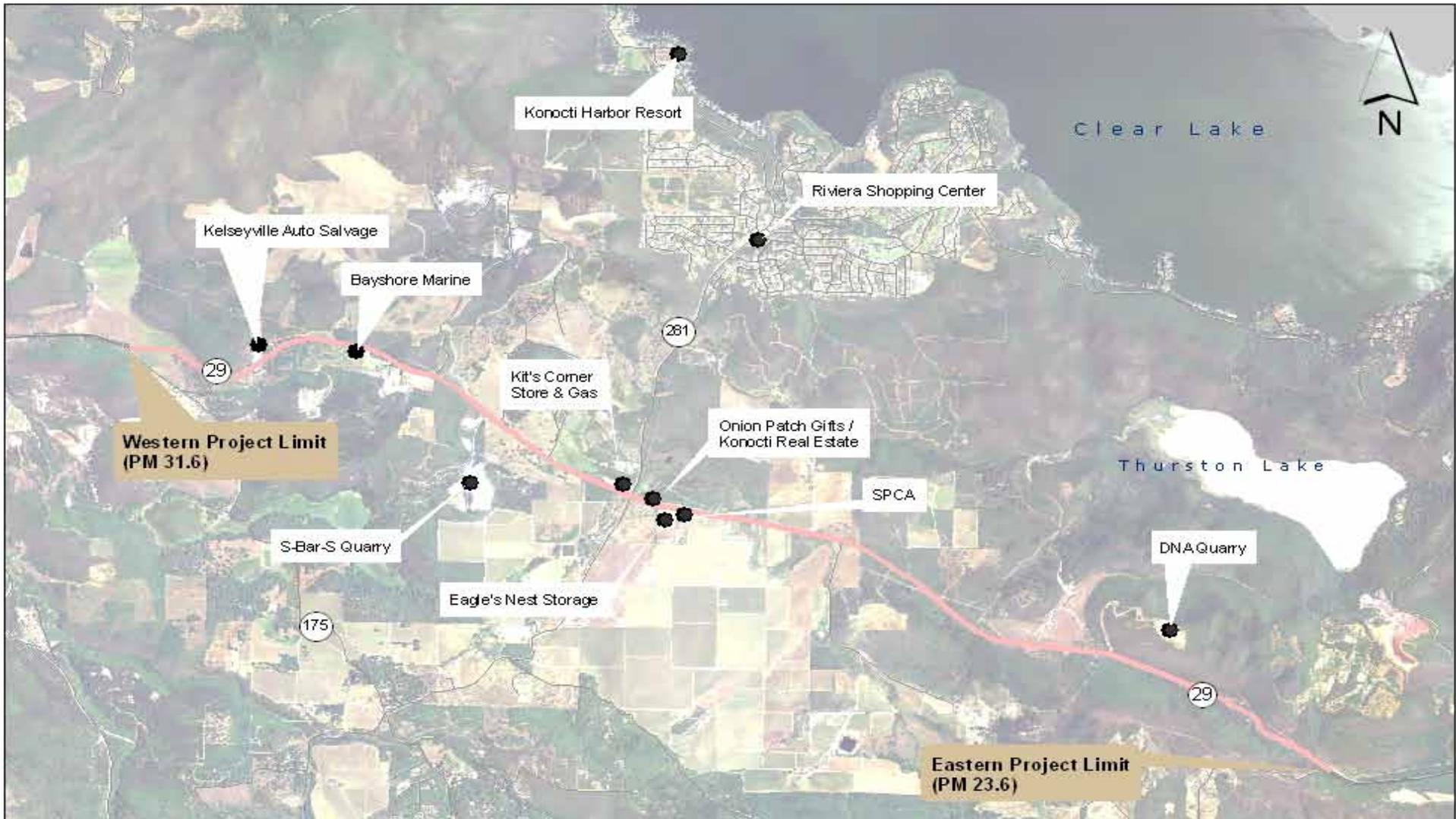
Other Businesses in Project Area

East of Kit's Corner along SR 29 are several small businesses, including Konocti Real Estate and the Onion Patch Gift Shop (located together in the one building), the Clearlake SPCA office, and Eagle's Nest Storage. Farther east along SR 29 and adjacent to Manning Flat is the DNA rock quarry. The S-Bar-S Quarry is located on the south side of SR 29 west of Kit's Corner. Bayshore Marine, located west of the S-Bar-S Quarry on the south side of SR 29, offers new boat sales and service, as well as consumer propane and wood fuel supplies. Kelseyville Auto Salvage and Towing is located on a 17-acre parcel north of SR 29 near the project's western limit.

Vineyards

Since the late 1990s, agriculture in Lake County has become increasingly oriented toward wine grape production. In 1997, Bartlett pears were the most valuable agricultural commodity in Lake County, worth \$27.5 million. In 2005, the county's pear crop was worth \$12.8 million, while the county's grape production was worth a total of \$38 million (*Lake County 2005 Crop Report*; Lake County 2006b).

In the project area, vineyards and other grape-growing interests own approximately 2,000 acres, though not all of this land is currently producing grapes. Large portions of the farmland adjacent to SR 29 are planted with vineyards. Three small vineyards as well as one large operator, Beckstoffer Vineyards, are currently located within the project limits. The main entrance to the Beckstoffer Farm Yard Center is located on the south side of SR 29, roughly adjacent to the Clearlake SPCA facility. In addition,



**FIGURE 2.4-2 – PROJECT
AREA BUSINESSES**

01-LAK-29
PM 23.6/31.6
EA 2981U0
Lake 29 Improvement Project

a fourth vineyard/winery is under construction adjacent to SR 29 near Konocti Camp Road.

2.4.2.6 Scotts Valley Band of Pomo Indians

The 36-acre property on the southeast corner of the SR 29/281/Red Hills Road intersection is owned by the Scotts Valley Band of Pomo Indians.

Several federal statutes give the United States Secretary of the Interior the authority to take lands owned by Native Americans into trust (Congressional Research Service Report for Congress 2007). According to information from the National Congress of American Indians, lands in trust fall under the authority of the tribal government and are generally not subject to state laws (National Congress of American Indians 2007).

The Scotts Valley Band of Pomo Indians has not filed to place this 36-acre parcel in trust with the United States Department of the Interior's Bureau of Indian Affairs.

As mentioned in Section 2.1.1, the 2005 Lake County RTP describes the preliminary plan for this parcel. The tribe has discussed a development that would include approximately 35 homes, an apartment complex, a retirement facility, a restaurant, a museum/cultural center, a park, and a helipad.

The property is zoned for Resort Commercial use. The property currently contains a vacant farmhouse and storage structure associated with its prior use as a walnut ranch, and two recently constructed residences.

2.4.3 Impacts

2.4.3.1 Temporary and Construction Impacts

No Build Alternative

The No Build Alternative would have no construction or temporary impacts on the project area community.

All Build Alternatives

All of the build alternatives would require construction on the existing alignment of SR 29. During construction, traffic is likely to be controlled, resulting in minor delays. While some detour routes would be available, construction would inconvenience residents of the project area and the adjacent communities of Kelseyville and Lower Lake. However, this impact would be temporary.

Construction activities would result in delays for vehicles bound for Konocti Harbor and other resorts in this area. Construction would likely occur during summer months when recreational traffic through this area is high. However, the impact to traffic passing through the project corridor during a vacation in this area would be minor, not likely resulting in a delay of more than 15 minutes (one-way).

Nighttime construction could interfere with concert traffic to and from Konocti Harbor on a periodic basis. Because this could involve, in some cases, upwards of 3,000 vehicles (Konocti Harbor's outdoor amphitheatre seats 5,000), coordination with Konocti Harbor is recommended in the event of nighttime construction.

To ensure that businesses in the project area would be minimally affected by construction activity on SR 29, Caltrans will prepare a Traffic Management Plan to accommodate business access during construction. Caltrans will also avoid obscuring business signs during project construction.

2.4.3.2 Permanent Impacts

Impact on Community Cohesion

All Alternatives

None of the build alternatives would substantially alter the way members of the communities in the project area interact with one another. Currently, SR 29 is a sufficiently large and busy road to qualify as a dividing line through this area. The project area is rural, and no meeting places such as parks, restaurants, schools, churches, bars, or theaters are adjacent to this portion of SR 29. As a result, residents of the area have few opportunities to meet informally within the project area. None of the build alternatives is likely to have adverse impacts on community cohesion.

Residential Displacement Impacts

Hardship Applications

Hardship applications have been filed by and approved (state-funded only) for two homeowners in this area. A hardship application is a request on a property owner's part that makes a case for the early acquisition of a home or other property based on the hardship that would be caused by waiting for the sometimes lengthy right of way process to take place. To be considered, all proposed build alternatives would require the acquisition of these properties.

These two residential displacements are included in the counts of residential displacements given below.

The Community Impact Assessment and the *Draft Relocation Impact Report* (DRIR) were used to estimate the number of residential displacements that would be required under each of the build alternatives and evaluated the resources that would be available to ensure the timely relocation of displaced residents. The DRIR evaluation is based on the availability of comparable replacement units in the replacement area, which is defined to include Lakeport, Kelseyville, Lower Lake, and Clearlake, all within 15 miles of the displacement area.

The DRIR concludes that the State's relocation program is adequate to successfully relocate all displacees given enough time to do so; that relocation would be affordable to residential displacees given the use of replacement housing payments; and that relocation areas are comparable to the project area in terms of amenities, public utilities, and access to public services, transportation, and shopping.

The DRIR and the Community Impact Assessment provide the best available estimate of the numbers and kinds of structures that would be displaced under each of the build alternatives, based on the alternatives' current designs. Until an alternative is selected and its design finalized, data on relocations and displacements should be considered preliminary.

No Build Alternative

The No Build Alternative would not result in the displacement of any residents of the project area.

All Build Alternatives

Impacts to residential units in the project area vary depending upon the configuration selected for the SR 29/281/Red Hills Road intersection. Three configurations are under consideration for this intersection: two grade-separated interchange options (a spread diamond interchange and a partial [two-quadrant] cloverleaf interchange) and one at-grade signalized intersection option. It is expected that the project will result in up to seven residential displacements.

Alternatives C1, C2, and C3 would each result in the displacement of six (at-grade signalized intersection and partial cloverleaf interchange option) to seven residential units (spread diamond interchange option). Of these residences, one is under construction, two are occupied, and four are vacant or abandoned. Alternative D would require five (at-grade signalized intersection and partial cloverleaf interchange option) to six (spread diamond interchange option) residential displacements. Of the residential units affected by Alternative D, one is under construction, two are

occupied, and three are vacant or abandoned. Additionally, each of the proposed build alternatives would affect numerous outbuildings, such as barns and sheds.

Relocation assistance payments and counseling will be provided to persons and businesses in accordance with the Federal Uniform Relocation Assistance and Real Properties Acquisition Policies Act, as amended, to ensure adequate relocation and a decent, safe, and sanitary home for displaced residents. All eligible displacees will be entitled to moving expenses. All benefits and services will be provided equitably to all residential and business relocatees without regard to race, color, religion, age, national origins, or disability, as specified under Title VI of the Civil Rights Act of 1964 (Appendix D).

Business Displacement Impacts

No Build Alternative

The No Build Alternative would not require any businesses in the project area to be relocated.

All Build Alternatives

Kelseyville Auto Salvage and Towing, located near the project's western limit, would be affected under each of the build alternatives. Alternatives C1 and C3 would affect the front parking lot of this business. Alternative C2 would affect the front parking lot and one of the structures. Alternative D would affect only a small portion of the front parking lot. On-site relocation of these facilities is likely, and a full relocation of the auto salvage facility may not be required.

Bayshore Marine would be relocated by Alternatives C1, C2, and C3. Alternative D would not affect this business.

Impacts to other businesses in the project area vary depending upon the configuration selected for the SR 29/281/Red Hills Road intersection. As noted above, three configurations are under consideration for this intersection: two grade-separated interchange options (a spread diamond interchange and a partial [two-quadrant] cloverleaf interchange) and one at-grade signalized intersection option.

SPREAD DIAMOND INTERCHANGE

Under Alternatives C1 and C3, the spread diamond interchange would require the acquisition of Kit's Corner (all six businesses [gas station/convenience store, barber shop, dog grooming shop, gift shop, Trader's Lot, and hair salon] and Creekside Motel) as well as the other businesses at this intersection (Eagle's Nest Storage, the

SPCA, Konocti Real Estate, and the Onion Patch Gift Shop). Under Alternative C2, the spread diamond interchange would require the acquisition of Kit's Corner (all six businesses and Creekside Motel) as well as Konocti Real Estate and the Onion Patch Gift Shop. Under Alternative D, the spread diamond interchange would require the acquisition of Kit's Corner (all six businesses and Creekside Motel), Konocti Real Estate, the Onion Patch Gift Shop, and Eagle's Nest Storage.

PARTIAL CLOVERLEAF INTERCHANGE

Konocti Real Estate and the Onion Patch Gift Shop would be displaced under all of the build alternatives with the partial cloverleaf interchange option.

Under Alternative C1, construction of a partial cloverleaf interchange would require the acquisition of all six Kit's Corner businesses and Eagle's Nest Storage. It is not anticipated that Creekside Motel would be acquired under Alternative C1.

Under Alternative C2, construction of a partial cloverleaf interchange would require the acquisition of all six Kit's Corner businesses, but not the Creekside Motel.

Under Alternative C3, the partial cloverleaf interchange would require the acquisition of all six Kit's Corner businesses, Eagle's Nest Storage, and the SPCA. Again, the acquisition of Creekside Motel is not anticipated under this alternative.

Alternative D with the partial cloverleaf interchange option would require the acquisition of only the Trader's Lot business at Kit's Corner (in addition to Konocti Real Estate and the Onion Patch Gift Shop as noted above).

SIGNALIZED INTERSECTION

With the at-grade signalized intersection option, Konocti Real Estate and the Onion Patch Gift Shop would be acquired under all of the build alternatives.

Impacts to Kit's Corner under the at-grade, signalized intersection option would be the same as under the partial cloverleaf option (relocation of all businesses other than Creekside Motel under Alternatives C1, C2, and C3, but only the displacement of the Trader's Lot business under Alternative D).

Alternatives C1 and C3 would require relocating Eagle's Nest Storage, and Alternative C3 would also require the relocation of the SPCA building.

RELOCATION OPTIONS

Relocation assistance would be provided to all displaced businesses. Relocation may adversely affect any business, since it means leaving a location in which the business has established its clientele.

Of the displaced businesses, only a few are likely to be highly dependent on their visibility from the roadway. While any business may benefit from a highly visible location, some businesses currently located along SR 29 cater primarily to local customers rather than through traffic. Businesses that cater to residents, such as the SPCA and Eagle's Nest Storage, would likely fare as well economically if they were located on less heavily traveled roads. Replacement properties for these businesses in the Kelseyville/Lower Lake/Clear Lake Riviera area are plentiful.

Kit's Corner, Bayshore Marine, Konocti Real Estate, and the Onion Patch Gift Shop all benefit from accessibility from the roadway and high visibility to through traffic. Replacement properties for these businesses may be difficult to locate, particularly given the limited access resulting from the conversion to an expressway.

Employment Impacts

No Build Alternative

The No Build Alternative would not affect employment.

All Build Alternatives

Alternatives C1, C2, and C3 would displace between nine and 12 local businesses. Alternative D would displace between three and 10 businesses.

None of the businesses that might be displaced employ more than 20 full-time workers. Together, however, these businesses are estimated to employ approximately 70 to 85 workers. Within the project area, home to approximately 2,900 workers, these businesses represent employment for nearly 3 percent of the workforce. If these businesses were not re-established elsewhere, the addition of these displaced workers to the pool of unemployed workers would increase the unemployment level in the project area from approximately 8.4 percent (using 2000 U.S. Census data) to approximately 11 percent.

The effects of business displacement on local employment levels would be moderated by the fact that replacement properties for the displaced businesses are likely to be plentiful in the area. On average, workers in Lake County have 30-minute commutes, and very few workers (less than 4 percent countywide) walk or use public transit to

get to work. As it is likely that the businesses displaced by the proposed project would be able to relocate in Lake County, access to workplaces is not expected to be a concern.

Environmental Justice

No Build Alternative

The No Build Alternative would not result in disproportionately high and adverse impacts on members of any minority or low-income communities in the project area.

All Build Alternatives

None of the proposed build alternatives would have disproportionately high and adverse effects on any minority or low-income populations, as discussed in Executive Order 12898 regarding environmental justice.

The only minority population identified in the project area is the Scott's Valley Band of Pomo Indians, which owns the parcel on the southeastern corner of the SR 29/281/Red Hills Road intersection. There are two newly constructed residences on this parcel suitable for housing. The parcel is not held in trust with the Bureau of Indian Affairs. The tribe is considering residential, commercial, and resort-type development on this parcel, but no plans have been finalized. All of the proposed build alternatives would require the acquisition of some portion of this parcel. The grade-separated interchanges would require 6 to 10 acres of this 35.8-acre parcel. Of the signalized intersections, Alternatives C3 and D would have the greatest impacts, on the order of 3 acres, while Alternatives C1 and C2 would have impacts on the order of 1.5 acres. The tribe would receive fair market value for any property acquired.

No other populations of low-income, minority, or elderly residents have been identified in this area.

2.4.4 Avoidance, Minimization, and Mitigation Measures

No avoidance, minimization, or mitigation measures are required.

2.5 Utilities, Emergency Services, and Community Facilities

2.5.1 Affected Environment

2.5.1.1 Water and Wastewater

No community water or wastewater services are available in the project area. Individual parcels are served by groundwater wells. There are two small water distribution systems in the project area that are registered with the State Health Agency: Kit's Corner and the Konocti Conservation Camp. Both have their own water lines, with water supplied from wells.

Kelseyville is served by the Kelseyville County Waterworks, and the Konocti Harbor area is served by the Mount Konocti Mutual Water Company. Neither of these services extend into the project area.

In Lower Lake, Lake County Waterworks District No. 1 provides water. The Lake County Sanitation District provides wastewater treatment services. These service providers also do not extend into the project area.

2.5.1.2 Other Utilities

Pacific Gas and Electric Company (PG&E) owns an electrical substation on SR 281 (Soda Bay Road), just north of Kit's Corner. PG&E also has electrical transmission wires on poles adjacent to SR 29 throughout the project area. An underground AT&T fiber optics cable runs along SR 29 through the project area, with a fiber optic cable regeneration station also located in the area. Overhead telephone lines run through the project area.

2.5.1.3 Fire Protection

The Kelseyville Fire Protection District operates a fire station in Kelseyville. This fire department responds to emergency calls in the project area. The district also operates a substation, Station No. 4, located at 9757 SR 281 (Soda Bay Road) in the Clear Lake Riviera community. The Lower Lake Fire Protection District has a fire station in the community of Lower Lake and an auxiliary station near Point Lakeview Road. This department responds to calls as far west as Diener Drive, the eastern edge of the project area.

The California Department of Forestry and Fire Protection (CDF) Kelsey-Cobb Station is located south of the project area, on SR 175 near the intersection of Red Hills Road. The CDF responds to wildland fire emergencies located outside of the

jurisdictions of the local fire protection districts. According to an engineer at the Kelsey-Cobb Station, approximately 60 percent of this station's calls require personnel and equipment to pass through the project area. Annually, the Kelsey-Cobb Station's most active period is between the beginning of June and the first week in November.

2.5.1.4 Law Enforcement

The unincorporated area of Lake County is patrolled by the Sheriff's Department. Approximately 25 officers are on patrol in the county.

2.5.1.5 Konocti Conservation Camp

Konocti Conservation Camp is a joint operation of the California Department of Corrections and Rehabilitation (CDCR) and CDF. The camp, located south of SR 29 in the project area, houses 115 male minimum-custody felons. This facility also includes housing for CDCR and CDF and staff that may opt to live on-site. Inmates are employed in public works/conservation projects and respond to emergencies that CDF normally responds to, including wildland fires, floods, earthquakes, search and rescue, and other disasters (Lake County Grand Jury 2001–2002).

2.5.1.6 Hospitals

Redbud Community Hospital

Redbud Community Hospital in Clearlake serves southern Lake County. Facilities include a 24-hour emergency room, an intensive care unit, women's services, and home healthcare. The hospital has 70 physicians on staff (Adventist Health Hospitals 2002). Emergency responders in the project area usually bring emergency cases to this hospital.

Sutter Lakeside

Sutter Lakeside in Lakeport is a 69-bed hospital that includes a medical surgery wing, an intensive care unit, an urgent care center, and an obstetrics unit. The hospital is open 24 hours and includes outpatient services (Sutter Lakeside Hospital 2002).

2.5.1.7 Transit

Lake Transit provides six different bus routes that encompass Clear Lake and connect the largest communities in Lake County. Bus Route 4 passes through the project area, running seven round trips daily between Lower Lake and Lakeport, with stops in Kelseyville. This route includes a stop at Kit's Corner. The Kit's Corner bus stop is also a transit point for bus riders, including school-aged children, transferring from

Route 4 to Route 2. Route 2 provides service to the southern communities of Cobb, Middletown, and Loch Lomond.

2.5.2 Impacts

2.5.2.1 Temporary and Construction Impacts

No Build Alternative

The No Build Alternative would not involve construction and, therefore, would not result in temporary impacts on utilities or emergency services.

All Build Alternatives

During roadway construction, emergency vehicles may need to stop temporarily or slow down in order to ensure that they can safely pass through the project area. Given the availability of response vehicles in this area (Kelseyville has personnel to the north and west of the project area, CDF has a station to the south, and Lower Lake has personnel to the west that could respond if needed), delays due to construction would not increase emergency response times substantially. Fire prevention offices in this area, as well as medical emergency response teams in Clearlake and Lakeport, would be notified of the dates and times of construction-related traffic restrictions.

2.5.2.2 Permanent Impacts

Konocti Conservation Camp

No Build Alternative and Alternatives C1, C2, and C3

The No Build Alternative and Alternatives C1, C2, and C3 would not affect Konocti Conservation Camp.

Alternative D

Alternative D would require the acquisition of a portion of the Konocti Conservation Camp facility that has been developed with two residences to provide optional housing for CDCR and CDF personnel. Several outbuildings are also located on the parcel. On-site relocation would be necessary, given the nature of this facility.

Transit

No Build Alternative

The No Build Alternative would not affect bus service in this area and would not alter the location of any bus stops.

All Build Alternatives

The build alternatives would all require relocating the Lake Transit bus stop currently located at Kit's Corner. Caltrans would coordinate the relocation of this stop with Lake Transit, in order to best serve transit users in this area.

Emergency Response Time

No Build Alternative

Given increased congestion on SR 29, emergency vehicle response times would likely increase in the future under the No Build Alternative, although the increase would likely not be substantial.

All Build Alternatives

Construction of an expressway under the proposed build alternatives would improve accessibility and reduce emergency response times along SR 29. This would be a beneficial impact.

Utility Relocation

No Build Alternative

The No Build Alternative would not result in the relocation of any utilities.

All Build Alternatives

Alternative D would not require the relocation of the PG&E substation on SR 281 (Soda Bay Road), north of Kit's Corner. It is likely that the need for relocation of the substation would be avoided during final design of Alternatives C1, C2, and C3 as well. However, should project plans eventually call for the relocation of the PG&E substation, this facility would not be closed until after the construction of a new substation elsewhere. This would ensure an uninterrupted power supply to residents and businesses.

All of the build alternatives would require the relocation of more than 2,000 feet of electrical lines and a fiber optics cable owned by AT&T, currently located in state right of way. The fiber optics regeneration station would also be relocated.

After an alternative has been selected for construction, AT&T will determine how it would prefer to see its facilities relocated. It is anticipated that AT&T's underground cable will be placed outside of the state right of way.

Relocation of utilities may result in short-term service interruptions, although with standard construction practices, such interruptions would be minimal.

Pursuant to Public Utilities Commission General Order 131-D, special permitting is required for the relocation of more than 2,000 feet of privately owned power lines operating at voltages in excess of 50 kilovolts. At the time Caltrans receives the utility owners' proposed relocation plans, a review may be needed to determine if further environmental studies would be needed.

2.5.3 Avoidance, Minimization, and Mitigation Measures

No avoidance, minimization, or mitigation measures are required.

2.6 Traffic and Transportation/Pedestrian and Bicycle Facilities

2.6.1 Affected Environment

SR 29 travels approximately 8.0 miles through a developed rural setting between SR 53 to the south and SR 20 to the north. It is a principal roadway that connects traffic to the primary regional roads of Lake County, namely SR 175, which carries traffic to US 101 to the west; SR 281 (Soda Bay Road), which serves the south shore of Clear Lake for recreational, commercial, and residential users; SR 53 to the south, which connects to SR 20; and SR 20, which serves the north shore of Clear Lake. Together with SR 20 and SR 53 (around the south shore of Clear Lake), SR 29 also forms the Lake County portion of the SR 20 Principal Arterial Corridor.

The SR 29/281/Red Hills Road intersection currently consists of a four-way at-grade unsignalized intersection that experiences significant congestion, queuing, and delays. From this intersection, Red Hills Road serves as a major access route to recreational, commercial, and residential areas. Lake County residents and recreational visitors use SR 29 primarily for local trips within the county and for trips to and from the Napa Valley, Santa Rosa, and the Bay Area.

In addition to the Clear Lake-bound travelers, other sources of recreational traffic include resorts, camping facilities, cabins/cottages, and year-round residential housing. This mix of generators and attractors create a significant amount of traffic in and out of this area.

No bicycle or pedestrian facilities exist on the current roadway, and SR 29 is not a designated bike route. Each of the build alternatives would, however, provide sidewalks at the SR 29/281/Red Hills Road intersection, and each of the grade-

separated interchange options would also provide bicycle facilities at this location. The addition of wider shoulders to the roadway would also be expected to increase safety for both bicyclists and pedestrians. The Regional Bikeway Plan for Lake County identifies several potential Class II bikeways in the project area, including Red Hills Road from SR 29 south to SR 175, Soda Bay Road from Clear Lake State Park to SR 281, and Point Lakeview Road from SR 281 to SR 29.

2.6.1.1 Safety

The Caltrans Office of Traffic Safety performed a collision analysis in the project area between January 1, 2000, and December 31, 2004 (Caltrans 2006b). During this period, there were 162 collisions, 93 of which resulted in injuries and one of which was fatal. The collision rate for the mainline section of SR 29 is 1.10 collisions per million vehicle miles (MVM) traveled versus the state average collision rate of 1.24 per MVM. An analysis conducted for the portion of SR 29 north of the SR 29/281/Red Hills Road intersection (PM 27.4 to 31.6), however, revealed that this segment has an actual collision rate of 1.63 collisions for every MVM traveled, which is 1.4 times the state average collision rate for similar roadway facilities.

2.6.1.2 Traffic Classification

Traffic within the project area was observed and classified by vehicle type. Automobiles represented 86 percent of the total. The remaining 14 percent was composed of buses, recreational vehicles, trucks, pick-ups with campers, and autos with trailers. Of the non-automobiles, 38 percent were two-axle trucks, 23 percent were five-axle trucks, 14 percent were autos towing boats, and 2 percent were recreational vehicles. The percentage of truck traffic along this corridor is important due to the rolling and winding terrain of the region. Regional transportation goals specify that an effort will be made to divert truck traffic from SR 20 to SR 29 and SR 53 in the future.

2.6.1.3 Traffic Projections

Traffic counts were collected by the Caltrans Office of Travel Forecasting and Modeling in May 2001. The counts were taken over several days, including a long weekend, and include mainline volumes, peak hour volumes, turn movements, 24-hour traffic classification, and recreational activities. Updated traffic forecasts were completed in early 2007. An annual growth factor of 1.8 was used to forecast future travel demand, which essentially translates into a traffic increase of 80 percent over 20 years. This was derived from the State Highway Inventory for the area in addition to the historical growth rate used to project future growth.

To better understand future traffic impact in terms of traffic density, a volume to capacity (V/C) ratio is used, in which V is traffic volume and C is the carrying capacity of a lane of traffic. The National Highway Institute identifies 2,100 vehicles per hour per lane as maximum capacity.

As volume in traffic lanes increases, their level of service (LOS) degrades. This is measured on a graduated scale of LOS A to F, in which A is unrestricted free-flow travel and F is gridlocked, impeded movement. Other factors that can affect capacity and LOS include number of lanes, lane width, shoulder widths, vertical and horizontal alignments, design speed, vehicle type, and control conditions (stop signs, yield signs, and signals).

The proposed project’s traffic analysis was conducted for existing and future conditions. SR 29 operates at LOS D under existing conditions and is projected to operate at LOS E by 2035. The current average speed is 44.0 mph. Using a growth factor of 1.8, the average speed would drop to 36 mph by 2035.

Table 2.6-1 summarizes the expected change in average speeds, V/C, and LOS along SR 29 through the year 2035.

Table 2.6-1 Level of Service Analysis for SR 29

Post Mile and Direction	Year 2005 Conditions			Year 2015 Conditions			Year 2025 Conditions			Year 2035 Conditions		
	Avg Speed	V/C	LOS									
23.63 – 27.90 NB	44	0.31	D	42	0.41	D	39	0.53	E	36	0.65	E
27.90 – 23.63 SB	43	0.20	D	42	0.28	D	39	0.33	E	35	0.40	E
27.90 – 31.05 NB	43	0.22	D	42	0.28	D	39	0.35	E	36	0.42	E
31.05 – 27.90 SB	44	0.33	D	42	0.44	D	39	0.57	E	36	0.69	E
Averages*	44	0.27	D	42	0.35	D	39	0.44	E	36	.54	E

Notes:

* Figures have been rounded.

NB = Northbound; SB = Southbound

2.6.1.4 Intersections

SR 29/281/Red Hills Road

The intersection of SR 29 and SR 281 currently operates at LOS E, and this is expected to drop to LOS F within 10 years under the No Build Alternative.

About 66 percent of peak-hour traffic on SR 29 passes through in both the northbound and southbound direction.¹⁶ Of the remaining traffic, over 90 percent turns north onto SR 281 to access Clear Lake. Less than 10 percent travels south on Red Hills Road.

Approximately 88 percent of traffic on SR 281/Red Hills Road travels south, originating from the Soda Bay area. Of this traffic, 47 percent turns north onto SR 29 and 41 percent turns south; 12 percent continues south on Red Hills Road. Traffic moving north on Red Hills Road represents 12 percent of the total, with the majority continuing north to access the lake.

Table 2.6-2 summarizes the expected change in LOS at the SR 29/281/Red Hills Road intersection through the year 2035.

Table 2.6-2 Current and Future LOS at SR 29/281/Red Hills Road Intersection

Approach	2005	2015	2025	2035
SR 281	E	F	F	F
Red Hills Road	F	F	F	F

Note: LOS is not defined for the intersection as a whole for two-way-stop controlled intersections but for the minor approaches only (SR 281 and Red Hills Road).

SR 175/SR 29

The intersection at SR 175 at SR 29 is also unsignalized. Although signalization is not proposed at this intersection, widening to a four-lane expressway at this location will address the “directional split” encountered at this location with traffic volumes increasing in the southbound direction caused by traffic turning onto southbound SR 29 from SR 175. The intersection will also be realigned in order to meet current design standards.

2.6.2 Impacts

2.6.2.1 Temporary and Construction Impacts

No Build Alternative

The No Build Alternative would not involve construction and therefore would not result in temporary impacts on traffic and transportation.

¹⁶ Although SR 29 is considered a northbound/southbound highway, the roadway trends east/west in the project corridor. For purposes of this discussion, however, the ultimate travel directions of north and south are used.

Build Alternatives

Construction to widen SR 29 to four lanes (two lanes in each direction) could result in some temporary disruptions of traffic flow, where temporary lane shifts or closures (depending upon the alternative selected) are required. A construction staging plan would be developed to maintain traffic flow. A Traffic Management Plan would also be developed to provide appropriate signing and striping along the roadway segments. Access to side roads and existing driveways would be maintained at all times.

2.6.2.2 Permanent Impacts

No Build Alternative

Under the No Build Alternative, the LOS along SR 29 and at the SR 29/281/Red Hills Road and SR 175/SR 29 intersections would continue to decline as described above. In addition, no safety upgrades and improvements would be made to SR 29 or the intersections at SR 281/Red Hills Road or SR 175. Table 2.6-3 summarizes the expected changes in average speed, V/C, and LOS for SR 29 for the No Build Alternative.

Table 2.6-3 Level of Service Analysis for SR 29 Under Existing and Proposed 2015, 2025, and 2035 Conditions

Post Mile and Direction	Year 2005 Conditions			Year 2015 Conditions			Year 2025 Conditions			Year 2035 Conditions		
	Average Speed	V/C	LOS									
No Build Alternative												
23.63 – 27.90 – NB	44	0.31	D	42	0.41	D	39	0.53	E	36	0.65	E
27.90 – 23.63 – SB	43	0.20	D	42	0.28	D	39	0.33	E	35	0.40	E
27.90 – 31.05 – NB	43	0.22	D	42	0.28	D	39	0.35	E	36	0.42	E
31.05 – 27.90 - SB	44	0.33	D	42	0.44	D	39	0.57	E	36	0.69	E
Averages	44	0.27	D	0.35	0.35	D	39	0.44	E	36	0.54	E
Alternatives C1, C2, C3, and D												
23.63 – 27.90 (Both Directions)	59	0.07	A	59	0.10	A	59	0.12	B	59	0.15	B
27.90 - 31.05 (Both Directions)	56	0.07	A	56	0.10	A	56	0.13	B	56	0.16	B
Averages	58	0.07	A	58	0.10	A	58	0.13	B	58	0.16	B

Note: NB = Northbound; SB = Southbound; V/C = Volume to Capacity Ratio; LOS = Level of Service

Build Alternatives

Upgrading SR 29 from a two-lane rural principal arterial to a four-lane expressway under Alternatives C1, C2, C3, and D would assist in the long-range plan to divert traffic from communities along the north shore, where traffic noise and the safety of pedestrians and nonmotorized traffic have been ongoing concerns. Ultimately, it is envisioned that through traffic (including truck traffic) between US 101 and I-5 will bypass SR 20, leaving this route and the “Main Street” communities that it serves to become more pedestrian friendly.

For each of the build alternatives, the proposed widening from two to four lanes and reclassification as an expressway with access control would improve the LOS, V/C, traffic queuing, and traffic delays over both existing conditions and the projected conditions under the No Build Alternative. SR 29 operates at LOS D under existing conditions and is projected to operate at LOS E by 2035. Under each of the build alternatives, the LOS would remain at B throughout the year 2035. The current average speed is 44.0 mph. Using a growth factor of 1.8, the average speed would drop to 36 mph by 2035. Under each of the build alternatives, the average speed would reach 58 mph. Table 2.6-3 summarizes the expected changes in average speed, V/C, and LOS for SR 29 for the build alternatives.

Safety

As mentioned previously, 1.10 collisions occurred for every MVM traveled on SR 29 between January 1, 2000 and December 31, 2004, which is typical for a rural two-lane highway. North of the SR 29/281/Red Hills Road intersection (PM 27.4 to 31.6), however, 1.63 collisions occurred for every MVM traveled, which is 1.4 times the state average collision rate for similar roadway facilities. Each of the build alternatives would reduce the collision rate on SR 29 by converting the current two-lane highway to a four-lane expressway. The statewide average for four-lane expressways is 0.50 collisions for every MVM traveled.

In addition, the project would improve safety on SR 29 by providing a modern four-lane facility that meets current design standards. Improvements to the horizontal and vertical alignment, addition of lanes that would create passing opportunities, removal of fixed objects, widening of shoulders, and addition of a 46-foot median would provide safety benefits to motorists in terms of increased sight distance, enhanced recovery areas, separation of traffic, and minimized exposure to fixed objects.

Intersections

SR 29/281/Red Hills Road

The primary entry point for the Soda Bay area is from SR 281/Red Hills Road at the intersection of SR 29. At present, this location experiences significant congestion, queuing, and delays. The proposed interchange options would increase capacity and decrease delay, thereby improving safety.

An LOS analysis for each of the build alternatives was conducted by Caltrans District 1 for the intersection of SR 29/281/Red Hills Road (Caltrans 2005). A turning movement count conducted in early 2005 and projected to the year 2032 was used to evaluate the operation of the intersection options under consideration at this time: a signalized intersection (non-interchange)¹⁷ as well as two interchange options: a spread diamond interchange or a partial (two-quadrant) cloverleaf with roundabouts interchange. Each interchange option has two further frontage road options. These interchange designs are described below. Examples of a spread diamond interchange and a partial (two-quadrant) cloverleaf with roundabout interchange are shown in Figures 1-3 and 1-4, respectively.

- **Spread Diamond.** This design proposes to shift the alignment of SR 281/Red Hills Road slightly to the east with a two-lane overpass (with a middle turn lane) crossing above SR 29 and will provide westbound and eastbound connector ramps to both SR 281 and Red Hills Road. Traffic signals are warranted at both intersections of the ramp termini. The proposed alignment would require the removal of the Kit's Corner retail complex in the northwest quadrant and the realignment of a minor local access road approaching Red Hills Road from the southwest quadrant. In addition, this interchange option would require an alternate access to properties northeast of the interchange.
- **Partial (Two-Quadrant) Cloverleaf with Roundabouts.** Similar to the spread diamond design, the proposed design of the partial (two-quadrant) cloverleaf with roundabouts interchange would shift the alignment of Red Hills Road slightly to the east with a two-lane overpass crossing above SR 29. A unique feature of this

¹⁷ Two additional Caltrans projects are currently planned that would add a traffic signal at the SR 29/281/Red Hills Road intersection. The first project, which is still in the environmental and project approval phase, would widen this intersection and add a traffic signal. The second project, which was approved in 2006 and is expected to be constructed in 2007, would add a left-turn lane and a traffic signal. The proposed project would necessitate either the replacement (signalized option) or removal of this signal (interchange option). As described above, the spread diamond interchange option would require traffic signals at both intersections of the ramp termini, while the partial cloverleaf option would not.

design is the addition of two roundabouts, on both sides of SR 29 (one on Red Hills Road and one on SR 281). These roundabouts would be connected by the overpass across SR 29 and would be placed at the ramp termini for the northbound and southbound directions of SR 29, which would eliminate the need for signalization at the ramp termini. The ramps for the two-quadrant cloverleaf interchange would be located in the northeast and southwest quadrants of the intersection. As with the spread diamond interchange, this option would include the realignment of a minor local access road approaching Red Hills Road from the southwest quadrant and an alternate access to properties northeast of the interchange. This option would increase capacity and decrease delay compared to the spread diamond option. The roundabouts would, however, provide a central location for truck turnaround.

Table 2.6-4 summarizes the expected LOS at the SR 29/281/Red Hills Road intersection for the different intersection scenarios.

Table 2.6-4 Level of Service Analysis for Intersection Scenarios at SR 29/281/Red Hills Road

Scenario	2005	2012	2032
No Build*	E/F	F	F
Signalized Intersection (Non-Interchange)	N/A	C	C
Spread Diamond	N/A	A	C
Two-Quadrant Cloverleaf (Roundabouts)	N/A	A	B

*LOS is for minor approaches only.

SR 175/SR 29

Each of the build alternatives will address the “directional split” encountered at this location with traffic volumes increasing on SR 29 in the southbound direction caused by traffic turning onto southbound SR 29 from SR 175. The intersection will also be realigned in order to meet current design standards.

2.6.3 Avoidance, Minimization, and Mitigation Measures

Alternatives C1, C2, C3, and D would increase capacity of the roadway and improve LOS in the project corridor. No mitigation measures are proposed.

2.7 Visual/Aesthetics

2.7.1 Regulatory Setting

NEPA establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 USC Section 4331[b][2]). To further emphasize this point, FHWA in its implementation of NEPA (23 USC Section 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, CEQA 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 [PRC] Section 21001[b]).

2.7.2 Affected Environment

2.7.2.1 Overview

The proposed project corridor generally follows low-lying areas crossing saddles of hills between valleys. Chaparral woodlands with oak and pine are visible on slopes at lower elevations, with agricultural and pasture lands located in the valleys. Freshwater marshes, vernal marshes, and vernal pools are visible immediately adjacent to the existing SR 29. Scenic resources visible from the proposed build alternatives include mountain ranges, rolling hills, meadows, oak woodlands, orchards, vineyards, wetlands, and Mount Konocti. Wetlands are visible adjacent to the road at Manning Flat.

Natural forms dominate the visual setting of the project corridor, although much of the landscape in the valley areas has been converted to agricultural, grazing, residential, and commercial uses. Visible features include highway pavement, vehicles, post and wire fencing, and small signs. Utility poles and wires are visible in limited locations. Buildings are few in number and include barns, storage buildings, and detached residences. The greatest concentration of buildings is around the SR 29/281/Red Hills Road intersection and includes Kit’s Corner in the northwest quadrant, a real estate office and self-storage facility to the east, and several homes on the hillsides to the south.

Additional residences are located adjacent to Kelseyville Auto Salvage and Towing, on Herman Kascher Ranch Drive, on Seigler Springs Road to the south, on the hillsides north of the highway in the Clear Lake Riviera community west of SR 281 (Soda Bay Road), and near Old Lower Lake Road and SR 175 at the western project limit.

The project is in a visually sensitive area. Lake County has identified SR 29 as being part of a scenic corridor and Mount Konocti as a regionally significant visual resource. Important visual resources identified in the Lake County General Plan include flatlands, rolling hills, orchards, vineyards, and open meadows.

2.7.2.2 Visual Impact Assessment

A visual impact analysis was conducted to assess the visual quality of the existing landscape and estimate the potential impacts to existing views from the project. The methods used to evaluate visual impacts were based on *Visual Impact Assessment for Highway Projects* guidelines (FHWA 1983). With this methodology, the visual environment was assessed for views from sensitive receptors that would be representative of the range of views of SR 29. Photographs were taken of representative views along the proposed project corridor, and visual simulations were prepared to give examples of visual impacts that would result from the build alternatives. Figure 2.7-1 identifies the locations of these views, which are discussed with respect to potential project impacts in the following section.

The visual character of the landscapes within the views were also evaluated. Visual quality is a measure of the excellence of a view and is ranked low, medium, and high for each of three criteria: vividness, intactness, and unity. These criteria are defined as follows (FHWA 1983):

- **Vividness:** The visual power or memorability of landscape components as they combine in striking and distinctive visual patterns.
- **Intactness:** The visual integrity of the natural and human-built landscape and its freedom from encroaching elements.
- **Unity:** The visual coherence and compositional harmony of the landscape concerned as a whole.

A high value for any single criterion does not indicate a high-quality view; rather, all three criteria must be ranked high to indicate high quality. This ranking is subjective

and is based on professional judgment. Each of the selected views was evaluated and ranked based on these criteria.

2.7.3 Impacts

2.7.3.1 Temporary and Construction Impacts

No Build Alternative

The No Build Alternative would not result in any temporary impacts related to visual resources.

All Build Alternatives

Construction is expected to occur over an 18- to 24-month period. Viewers would see materials, equipment, workers, and the operations of construction, including earthmoving operations and structures, during the construction process. Impacts of construction are unavoidable but would be temporary. Motorists and pedestrians would be exposed briefly to construction activities while passing through the construction zone. However, residents of adjacent homes would be exposed to these activities on a more continuous basis.

2.7.3.2 Permanent Impacts

No Build Alternative

The No Build Alternative would not change the current highway and would have no visual impacts on existing views.

All Build Alternatives

In general, Alternatives C1, C2, C3, and D would result in similar visual impacts due to the nature of their vertical alignments. All would have earth embankments with similar elevations. The proposed build alternatives would straighten the roadway alignment, cut through contours in certain locations, and elevate the highway as high as 16 feet above the existing grade at certain locations. Compared to Alternative D, Alternatives C1, C2, and C3 are straighter with long, wide curves that would encroach more on existing vegetation, wetland, and topographic features. Alternative D does not fully conform to existing topographical features but deviates to a lesser degree than Alternatives C1, C2, and C3 and encroaches less on the natural environment.

The build alternatives would result in visual impacts that would change the character and quality of the existing visual environment in certain locations. Whether or not the changes are perceived as adverse would depend on the sensitivity of the viewer, the

degree of change, the design of the element being evaluated, and how well the new element would blend into the existing visual environment.

Visual Changes at Key Views

The following photographic simulations (Figures 2.7-2 to 2.7-6) were prepared to give examples of visual impacts that would result from the build alternatives at representative views along the proposed project corridor. Figure 2.7-1 identified the locations of these key views. The potential change at each view is summarized below.

- **Key View A:** From a single-family residence on Herman Kascher Ranch Drive looking southeast toward SR 29 (Figure 2.7-2). This figure shows how the view of the existing highway would change with the construction of a 16-foot-high earth embankment to elevate the roadway. The embankment would not affect long-range views to the west but would block views to the south. However, this building is not occupied year-round and is only used seasonally as a temporary work location during the harvest of the nearby orchards.
- **Key View B:** From SR 29 looking west toward the Red Hills Road intersection (Figure 2.7-3). This figure shows how the view of the Red Hills Road intersection would change with the addition of travel and turn lanes. Utility poles, lines, roadway lights and signals that were seen in the view before would remain.
- **Key View C:** From a single-family residence looking north toward SR 29, with Mount Konocti visible in the distance (Figure 2.7-4). This figure shows how the view of the existing highway would change with the construction of the build alternatives (in this case, Alternative D). Vehicles traveling along the highway would continue to be screened from view.
- **Key View D:** From a single-family residence looking south toward SR 29 (Figure 2.7-5). This figure shows how the view of the existing highway would change with project construction (in this case, Alternative C3). Trees would be removed on the lower half of the hillside and an earth embankment would be constructed to elevate the roadway. A new access road would be constructed to the south of the house, resulting in the removal of a large oak tree.
- **Key View E:** From a single-family residence looking north toward SR 29, with Mount Konocti visible in the distance (Figure 2.7-6). This figure shows how the view of the existing highway would change with project construction (in this case, Alternative C2). Two travel lanes and earthen embankments would be added, and some vegetation would be removed.

Visual Quality Evaluation

As shown in Table 2.7-1, the quality of the views at the location shown in Figure 2.7-2 would be degraded as a result of the proposed build alternatives. This residence at this location, however, is not occupied year-round and is used a seasonal work location. The quality of the view at the location shown in Figure 2.7-5 would drop slightly in ranking due to the increased number of constructed features that would encroach on the natural environment.

Table 2.7-1 Summary of Visual Quality Evaluation

Figure	Existing			With Build Alternatives		
	Vividness	Intactness	Unity	Vividness	Intactness	Unity
2.7-2	High	Moderate	High	Low	Low	Low
2.7-3	Low	Low	Low	Low	Low	Low
2.7-4	High	Moderate	High	High	Moderate	High
2.7-5	Moderate	Low	Low	Low	Low	Low
2.7-6	High	High	High	High	High	High

Note: Where value judgments were made between two levels, e.g., moderate to low, the lower value was used for purposes of consistency in this table.

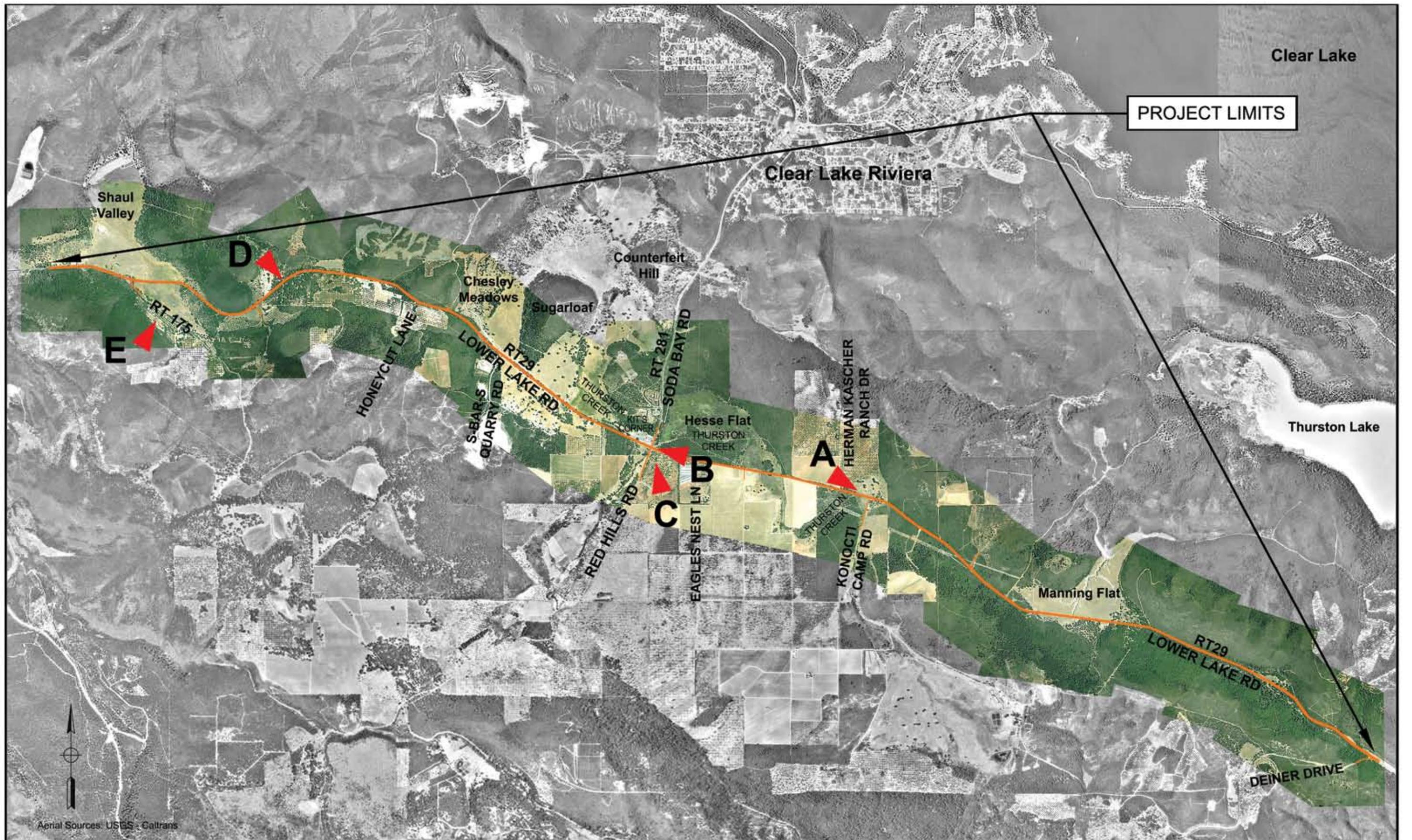
While the view shown in Figure 2.7-3 maintains the same quality ranking for both the existing and with-project views, new encroachments would decrease the intactness of the views. In addition, increased pavement and removal of vegetation would further decrease the element of unity in this view.

The views shown in Figures 2.7-4 and 2.7-6 generally do not change in ranking, which indicates no change or degradation in their existing and with-project visual quality.

Summary of Potential Visual Impacts

The following summarizes potential visual impacts to the character of the existing environment with Alternatives C1, C2, C3, and D and the interchange options.

Alternatives C1, C2, C3, and D would alter the visual character of the existing environment in the valleys by raising the elevation of SR 29 on earth embankments approximately 4.5 feet to 16 feet high. For motorists, the change would contrast with the existing character of the valleys and may be perceived as adverse. For residents with homes adjacent to SR 29 who have existing views across valleys and the natural environment, the embankments may partially screen their views, which may be perceived as an adverse visual impact.



Aerial Sources: USGS, Caltrans

26815174.00601	Key View Locations for Visual Quality Evaluation	Figure 2.7-1
Lake 29 Improvement Project		



View from a single-family residence on Herman Kascher Ranch Drive, existing conditions (top) and simulated view of project Alternative D (bottom).



View from SR 29 looking west toward the Red Hills Road intersection, existing conditions (top) and simulated view of project Alternative C2 (bottom).



View from a single-family residence looking north toward SR 29 and Mount Konocti, existing conditions (top) and simulated view of project Alternative D (bottom).



View from a single-family residence looking south toward SR 29, existing conditions (top) and simulated view of project Alternative C3 (bottom).

26815174.00601

Lake 29 Improvement Project

Key View D: View South Toward SR 29 from Between
Honeycut Lane and SR 175

Figure
2.7-5



View from a single-family residence looking north toward SR 29 and Mount Konocti, existing conditions (top) and simulated view of project Alternative C2 (bottom).

Each of the interchange options include a grade separation at the SR 29/281/Red Hills Road intersection. The structures would contrast with the natural environment and may result in adverse visual impacts for motorists, but only for very brief periods of time. For example, for very short durations during travel, motorists would have their views of Mount Konocti blocked by the grade separation structures. While some motorists may consider the blockage of views adverse, others may not.

Residents with mid-range views of the interchange may not be adversely affected by the structures due to trees that would screen their views of the interchange. Residents from distant vantage points off of Red Hills Road may see the overcrossing, but because of distance from the viewer, the details of the interchange would appear small and may not be perceived as an adverse visual impact.

Alternatives C1, C2, C3, and D would require removal of trees and other vegetation. Where trees screen residents' existing views of the highway, tree removal may be perceived as an adverse visual impact because views of highway and vehicles would be unobstructed. This would be the case for residents who live west of Soda Bay Road and who have elevated vantage points overlooking the highway in the Chesley Meadows area to the west of the SR 29/281/Red Hills Road intersection (see Figure 2.7-1). When tree removal is combined with a new highway alignment that is closer to residences, as is the case east of Bayshore Marine and west of Kelseyville Auto Salvage and Towing (just west of Key View E; see Figure 2.7-1), the visual impacts would be adverse since residents would see unobstructed views of Alternatives C1, C2, C3, or D at closer range than the current alignment.

Views of trees and wetlands contribute to the positive visual experiences of motorists who travel this scenic route. Where vegetation is removed, the change in the character of the natural environment may be perceived as adverse from the perspective of motorists. However, where the removal of vegetation opens up scenic vistas, motorists may perceive the change as a positive visual impact.

2.7.4 Avoidance, Minimization, and Mitigation Measures

To reduce the adverse visual impacts associated with the build alternatives and improve the visual character and quality of the project corridor, the following methods and materials will be implemented, as applicable, under the direction of the Caltrans landscape architect.

2.7.4.1 Avoidance and Minimization Measures

All build alternatives will have an effect on the existing visual character of certain locations within the project area. The changes may be perceived by some viewers as adverse; however, the potential impacts will be minimized by the incorporation of the following measures.

- Where rock slope protection is proposed for cut and/or fill slopes, suitable native rock material from the Clear Lake watershed should be considered. The use of native rock will improve the visual character of the highway infrastructure and help it blend into the natural viewshed.
- Tree and vegetation removal will be limited to only that which is required to construct the project.
- In locations where it is practicable to do so, after evaluating safety and maintenance needs, unearthed rock outcroppings will be preserved to restore the diversity seen in the undisturbed and natural landscape. If rock outcroppings are uncovered, the project landscape architect will be contacted as soon as possible to determine the grading plan between and around the rocks.
- Pigments and and/or surface treatments, such as concrete formlining, will be considered for structures to minimize the degree of visual impacts anticipated from project alternatives. If used, surface treatments would reflect the diversity in the surrounding visual environment.
- All native oak trees that are to remain within and adjacent to the proposed project will be designated as Environmentally Sensitive Areas (ESAs) and will be temporarily fenced with orange plastic construction (exclusion) fencing throughout all grading and construction activities. The exclusion fencing will be installed 6 feet outside of the dripline of each specimen tree, and will be staked a minimum of every 6 feet. The fencing is intended to prevent equipment operations in the proximity of protected trees from compacting soil, crushing roots, or colliding with tree trunks or overhanging branches.
- Where grading will occur in areas of riparian and wetland habitat, the upper 3 inches of soil (duff layer) should be removed and stockpiled within the project limits. The project biologist should examine this material for invasive species prior to stockpiling. This material will be used during revegetation upon completion of construction activities.
- To the extent possible, where retaining walls (not proposed at this time) and guardrails are needed, they will be designed to preserve motorists' views of the scenic features throughout the project limits.

2.7.4.2 Mitigation Measures

- A Revegetation and Restoration Plan will be prepared by the project biologist, project landscape architect, and Caltrans revegetation specialist for the project. The revegetation plan will address the following:
 - The revegetation/restoration plan will be designed to minimize soil loss immediately after construction and to revegetate disturbed areas (including areas in which it has been determined that the existing roadway will be obliterated) with native plants for long-term erosion control. The revegetation/restoration plan will be implemented to compensate for the loss and/or disturbance of vegetation on the project site, areas cleared for access, and construction staging areas. The revegetation/restoration plan will also include plans for plantings to soften the appearance of earth embankments constructed within the project area. The restoration plan elements will be graphically depicted on final construction plans, including the location and extent of the driplines for all trees, type and location of any fencing, and equipment storage and staging areas outside of dripline areas.
 - Revegetation and replacement planting will take place within the project right of way to the extent feasible.
 - To the extent feasible, native seeds (acorns), cuttings, or container stock regionally appropriate for the project area will be obtained. The project biologist, landscape architect, and/or revegetation specialist will develop a planting plan and pallet, and ensure the required species are available or propagated prior to planting. Plant material in containers larger than 1 gallon will be avoided, if possible.
 - Planting will take place in the fall and winter following the final construction season.
 - A monitoring program will be implemented. Plant establishment periods will be determined by the project landscape architect and the project biologist.
- Where cut slopes shallower than 1:1 are used, the top of the cut will be contour-graded to blend into existing topography.
- Cut and fill slopes should be no steeper than 1:2 and should be 1:4 where possible. If slopes steeper than 1:2 are required, the use of retaining walls should be considered.

2.8 Cultural Resources

2.8.1 Regulatory Setting

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

The National Historic Preservation Act of 1966, as amended (16 USC Section 470 et seq.), sets forth national policy for protecting historic properties. Historic properties include “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register of Historic Places” (NRHP). Section 106 of the National Historic Preservation Act requires federal agencies to account for the effect of federal undertakings on historic properties and to afford 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 Part 800).

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

Historic properties may also be covered under Section 4(f) of the United States Department of Transportation Act (49 USC Section 1653[f]), which regulates the “use” of land from historic properties.

Historical resources are considered under CEQA, as well as California Public Resources Code (PRC) Section 5024.1, the latter of 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 rights-of-way.

2.8.2 Affected Environment

2.8.2.1 Method of Analysis

Archaeology

Before field surveys took place, records searches and a literature review were conducted to identify prior investigations and previously recorded sites within and

adjacent to the survey area. Sources consulted included the Northwest Information Center of the California Historical Resources Information System at Sonoma State University, Rohnert Park, and the sacred lands file of the Native American Heritage Commission (NAHC). Representatives of local Native American groups were contacted regarding any heritage values associated with the project location, and consultation has been ongoing. The initial contacts, based on an updated list of Native American contacts provided by NAHC, consisted of letters dated February 23, 1999; September 3, 1999; and November 19, 2002. Subsequent consultation concerned the Phase II evaluation of portions of prehistoric archaeological sites within the Area of Direct Impact (ADI) of the Caltrans preferred alternative. This consultation, which was conducted with current tribal officials, consisted of letters dated April 7, 2005, and a series of phone calls made in April and May 2005. Representatives from the Big Valley Rancheria of Pomo Indians and the Lower Lake Rancheria of Koi Nation served as monitors during Phase II field investigations, and both groups reviewed the draft Phase II report.

The Area of Potential Effects (APE) established for the project roughly follows the Environmental Study Limits (ESL) (see Figure 1-2) and forms a variable corridor along both sides of the existing centerline of SR 29 with a total area of approximately 1174 acres. The APE for built environment resources includes the maximum proposed right of way and any parcels containing structures within 200 feet of the maximum proposed right of way. Caltrans delineated the original APE boundary on a map that was approved and signed by FHWA on November 25, 2002. Caltrans and FHWA consulted with SHPO and received concurrence regarding the adequacy of the original APE, pursuant to 36 CFR Section 800.4(a)(1), and the level of identification efforts to date, pursuant to 36 CFR Section 800.4(b)(1). Following the development of Alternative D, a new APE boundary was delineated. The new APE was approved and signed by FHWA on August 8, 2006. See Section 2.8.2.2 for information regarding consultation with SHPO following the development of Alternative D.

An intensive pedestrian archaeological survey was conducted during the months of June 2001 through September 2002. Following the development of Alternative D, an additional intensive pedestrian archaeological survey was conducted during the months of April 2005 through July 2006. The archaeological surveys were conducted to locate and document previously recorded and undiscovered historic, ethnographic, and prehistoric archaeological sites. Field methods involved surveyors who inspected the ground surface while walking a series of linear transects over the entire ESL.

Built Environment Resources

Caltrans began pre-field, archival research for historical resources by performing a records search at the Northwest Information Center. The Northwest Information Center, located at Sonoma State University, is one of twelve historical resources information centers in California that provide archaeological and historical resources information, on a fee-for-service basis, to local governments and individuals with responsibilities under NEPA, the National Historic Preservation Act, and CEQA, as well as to the general public. Subsequent pre-field research included contacting the Lake County Assessor to obtain construction dates for each improved parcel within the proposed project's APE.

Caltrans conducted a field survey of the project area in September 2002. During the field survey, each property requiring formal evaluation was photographed, and the physical appearance was documented. Caltrans evaluated each property for significance using NRHP and California Register eligibility criteria.

2.8.2.2 Archaeological Resources

Archaeological resources possess both scientific and cultural values. The specific site locations of archeological resources are confidential in order to deter vandalism and desecration. Therefore, only general locations associated with the proposed project are provided in this discussion.

The archaeological surveys for this project identified a total of six previously recorded prehistoric archaeological sites, 14 newly discovered prehistoric archaeological sites, 13 newly discovered historic archaeological sites or resources, and one newly discovered site that contains both prehistoric and historic components within the APE.

Following the identification of Alternative D as the Caltrans preferred alternative, sites that are located within the ADI of Alternative D were evaluated for NRHP eligibility. Only the portions of the sites located within the ADI were evaluated. Of the sites evaluated, only one portion of one prehistoric site has been found to be eligible for the NRHP. An evaluation of portions of six other prehistoric sites concluded that these areas would not contribute toward the NRHP eligibility of the sites. Three additional prehistoric sites and five historic-era sites or resources were determined to be ineligible for NRHP listing under any criteria. On September 28, 2006, FHWA submitted a Supplemental Historic Property Survey Report (SHPSR) to SHPO and requested SHPO concurrence on the adequacy of the APE pursuant to 36

CFR Part 800, the adequacy of the SHPSR and its attendant documents, and the eligibility findings as noted above for the portions of the sites that were evaluated. The SHPSR was received by SHPO on October 3, 2006, and the 30-day review period ended November 3, 2006. On January 22, 2007, Caltrans requested, via e-mail, that SHPO provide the status of the SHPSR review. As of February 23, 2007, SHPO had not provided a response to either the September transmittal letter or the January e-mail. FHWA has, therefore, assumed that SHPO has no objections to the eligibility determinations presented in the SHPSR, and is planning to proceed to the next phase of consultation.

As noted in Section 4.6, revisions were recently made to Alternative D in order to avoid potential impacts to three endangered plant species. As a result of these revisions, the ADI for Alternative D has also been revised, and additional evaluations of archaeological sites will be required.

2.8.2.3 Built Environment Resources

The APE for the proposed project contains 21 improved parcels. Six of the parcels contain buildings, structures, or objects that required formal evaluation. After applying the eligibility criteria, Caltrans determined that none of the evaluated structures appear to be eligible for listing in either the NRHP or the California Register, and are not historical resources for the purposes of CEQA. The evaluated structures are either common examples of a type or no longer retain sufficient integrity to merit recognition in either register. The remaining 15 parcels, which contain structures constructed after 1956, were treated in accordance with the Interim Policy for the Treatment of Buildings Constructed in 1957 or Later, which was in effect at the time (Caltrans 2002a). The Interim Policy allows qualified Caltrans architectural historians to exclude from study buildings that were constructed in 1957 or later. Caltrans staff revisited the unevaluated resources within the APE in 2006 and found that no additional properties had reached sufficient age or retain sufficient integrity to require formal evaluation. The buildings do not meet the 50-year age requirement for listing consideration and have no outstanding associations or characteristics that create sufficient significance to override the age requirement.

2.8.2.4 Ethnographic and Historical Overview

The project is located in Lake County, which was formed in May 1861 from a portion of Napa County. The county is home to Clear Lake, the traditional home of the Pomo tribe, and was not visited by Euro-Americans until the early part of the 19th century

when a party of fur traders made camp near Lower Lake on their way to the Russian settlement at Fort Ross (*History of Napa and Lake Counties, California*, 47).

Ethnographic Overview

The survey area lies near the boundary between land inhabited by the Eastern and Southeastern Pomo at the time of European contact. The Wappo used this same area seasonally. The Eastern Pomo were organized into five main village communities and each occupied a defined territory composed of land habitually used for hunting, fishing, and gathering. The Southeastern Pomo were organized into three main village-communities, although little information exists regarding these settlements. Each Eastern and Southeastern Pomo village had a semi-subterranean ceremonial house and a sweathouse. Residences, made of lake reeds, were circular in shape and housed several related families.

Subsistence activities for both the Eastern and Southeastern Pomo consisted of hunting and gathering wild plants, fish, and game. The mainstay of their diet was acorn mush and dried fish supplemented with fresh meat and waterfowl, clams, greens, roots, bulbs, berries, and fruits. Groups followed an annual cycle of movements in response to seasonal availability of food resources. Main villages were occupied throughout the winter and during the spring when fish moved into nearby shallow waters of spawning areas. Exploited fish species included suckers, pikes, hitch, and chay. During late spring and early summer, populations moved to scattered encampments along the lakeshore and other areas to fish and gather plant resources. They returned to main villages in the midsummer to collect pinole seeds, and in the fall they moved to temporary camps in oak groves to harvest acorns.

Both the Eastern and Southeastern Pomo traded extensively with coastal groups. Traded items included salt cakes, basketry materials, bows and arrows, obsidian blades, magnesite beads, feathers, and animal skins. Clamshell beads, used as a medium for exchange, were acquired through both trade and during expeditions to the coast.

Historical Overview

In 1821, a band of Spanish soldiers under the leadership of Luis Arguello crossed Lake County after recapturing Indians who had escaped from various missions in the area. During the following two decades, trappers continued to cross Lake County, but the first bona fide settlement occurred in the late 1830s under Captain Salvadore Vallejo.

In 1839, Captain Vallejo and his brother Antonio Vallejo took possession of the Laguna de Lup-Yomi Grant, encompassing Clear Lake and surrounding lands. By the late 1840s, the Vallejos were seeking a buyer for their holdings in Lake County. Native rebellion against harsh treatment at their hands played a part in their decision. Subsequently, in 1847, the Vallejo brothers sold their rancho to brothers Benjamin and Andrew Kelsey and Charles Stone.

California statehood opened the door for prospective immigrants. Settlement began in earnest in about 1850, with the arrival of Walter Anderson, Robert Gaddy, J. Broome Smith, William Graves, and Jefferson Warden (*History of Napa and Lake Counties, California*, 63–64). At this time, Clear Lake Township was part of Mendocino County, later becoming part of Napa County in 1855 (*History*, 100; Mauldin 1968, 15). Lake County proper was formed in 1861, and the town of Lakeport was designated the county seat.

The project is located on the road between Lakeport and Lower Lake, which appears on General Land Office maps as early as 1877. SR 29 generally follows the route of the old Lakeport and Lower Lake Road, which appears on later historic maps as the “Lower Lake Road” (USGS 1943). The portion of SR 29 between Lower Lake and its junction with Route 175, which encompasses the project APE, was originally defined in 1959 as Legislative Route Number 243. North of this point to Kelseyville, SR 29 was Legislative Route Number 89, which was defined in 1933. In the vicinity of the project, SR 29 is also eligible for designation as a California Scenic Highway (Faigin 2006, “State Route 29”). During the 50-plus years since its adoption into the state highway system, SR 29 has been resurfaced numerous times but retains the original alignment overall. The proposed project, however, would realign the existing roadway in several areas to eliminate horizontal and vertical curves that do not meet current design standards.

2.8.2.5 Recent History

Lake County remains an important recreational area in Northern California for the boating and fishing opportunities on Clear Lake. Although it has always been predominantly agricultural, in recent years Lake County has seen more vineyards established within its borders. Views of vineyards have replaced rows of fruit and nut trees seen in previous decades, and wine tasting is available at several locations. In addition, with the construction of Konocti Harbor, the region continues to attract visitors from surrounding counties.

2.8.3 Impacts

According to federal regulations, an adverse effect would occur if the undertaking alters, directly or indirectly, any of the characteristics of a historic property or site that qualify it for the NRHP (36 CFR Section 800.5[a][1]). According to state regulations, a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have an adverse (significant) effect on the environment (PRC Section 21084.1).

2.8.3.1 Temporary and Construction Impacts

No Build Alternative

The No Build Alternative would not change the current highway and would have no temporary or construction impacts on cultural resources.

All Build Alternatives

As discussed in Section 2.8.3.2, physical impacts to archaeological properties are considered permanent. Indirect impacts such as introduction of visual, atmospheric, or audible elements normally do not diminish the integrity of elements contributing to the eligibility of an archaeological property. None of the built environment resources within the APE are eligible for listing in the NRHP or the California Register or for consideration under CEQA; therefore, no temporary or construction impacts would occur.

2.8.3.2 Permanent Impacts

No Build Alternative

The No Build Alternative would not change the current highway and would have no permanent impacts on cultural resources.

All Build Alternatives

Adverse effects to eligible archaeological properties normally occur during the construction phase and involve physical destruction or damage, as defined in 36 CFR Section 800.5(2)(i). Physical impacts to archaeological deposits are considered permanent, since integrity is a prerequisite when an archaeological property is considered for NRHP eligibility. This is particularly important for archaeological properties where spatial relationships of artifacts and features reveal patterns of past human behavior. Loss of site integrity may exclude the possibility of effectively addressing research topics that require recovery of chronologically distinct assemblages or consideration of small-scale positions of cultural remains.

Most archaeological sites within the ESL exist in proximity to the existing highway and would be directly affected by each build alternative to varying degrees. No archaeological properties would be affected if the No Build Alternative is selected. Direct impacts related to the build alternatives would result from highway widening and realignment and from construction of the following features: cut and fill areas, possible haul roads, equipment staging and stockpiling areas, drainage improvements and attenuation basins, and utility relocation. Efforts will be made to avoid and/or minimize impacts to archaeological properties as much as possible. For example, staging and stockpiling areas can be established away from any archaeological properties. Some impacts to archaeological sites, however, may be unavoidable due to the need to also minimize impacts to other resources and/or to accommodate project design/construction constraints.

Based on evaluations conducted to date, only one portion of one prehistoric site has been found to be eligible for the NRHP. This site is within the ADI of each of the build alternatives.

2.8.4 Avoidance, Minimization, and Mitigation Measures

2.8.4.1 Avoidance and Minimization Measures

Archaeological resources are present within the APE, and the following measures will be taken to avoid and minimize damage to artifacts of cultural or historical value.

- An ESA Action Plan will be prepared to protect portions of known archaeological sites that are outside of the ADI limits.
- If prehistoric and/or historical artifacts are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the find. In the event that human remains are discovered or recognized during construction, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the Lake County Coroner has determined that the remains are not subject to provisions of Section 27491 of the Government Code. If the remains are determined to be Native American, the coroner shall contact the NAHC within 24 hours. The NAHC will appoint a Most Likely Descendent for disposition of the remains (Health and Safety Code Section 7050.5; PRC Section 5097.24).

2.8.4.2 Mitigation Measures

At this time, the number of archaeological properties requiring mitigation is unknown, as additional evaluations are required due to recent revisions to Alternative D. Once the additional evaluations are completed, the criteria of adverse effect can then be applied to those sites found to be eligible for NRHP listing, and consultations can occur regarding the resolution of potential adverse effects.

In order to mitigate for adverse effects of the project on archaeological sites found eligible for NRHP listing, a Phase III data recovery investigation will be implemented, in accordance with the terms of a Memorandum of Agreement that will be executed between FHWA and SHPO. The Memorandum of Agreement details the measures to be taken to complete the Phase III data recovery investigation.

Physical Environment

2.9 Hydrology and Floodplains

2.9.1 Regulatory Setting

Executive Order 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The FHWA requirements for compliance are outlined in 23 CFR Part 650 Subpart A.

In order to comply, the following must be analyzed:

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

The base floodplain is defined as the area subject to flooding by the flood or tide having a 1 percent chance of being exceeded in any given year. An encroachment is defined as an action within the limits of the base floodplain.

2.9.2 Affected Environment

2.9.2.1 Drainage

Within the project limits, SR 29 crosses several unnamed streams and crosses Thurston Creek at PM 27.23. Flooding at the Thurston Creek crossing stems from the Thurston Creek watershed and a smaller unnamed watershed located west of the highway and just north of the main watershed (Figure 2.9-1). The total area of these two watersheds is approximately 2,948 acres. Flows for Thurston Creek are shown in Table 2.9-1.

Table 2.9-1 Summary of Discharges for Thurston Creek

Flooding Location	Drainage Area (square miles)	Flows During 100-Year Flood (cubic feet per second)
At Lower Lake Road (SR 29)	4.9	1,630
At SR 281 (Soda Bay Road)	5.2	2,750
5,600 feet downstream of SR 281 (Northern Soda Bay Drive)	11.6	3,390

Source: FEMA 1988

Water from the smaller unnamed watershed flows through a set of double box culverts that cross SR 29 at PM 27.33, but the terrain upstream of the highway allows the high flows of the two streams to join before the flows cross the highway. Debris and sediment have accumulated in the drainage systems and would be considered in the design of the project. Caltrans maintenance records indicate drainage systems located at PM 27.23 and 27.33 and other nearby culvert crossings have experienced flooding in the past due to debris and sedimentation accumulation (Caltrans 2001a). The Preliminary Drainage Report for the project (Caltrans 2001a) states that downstream property owners are required to maintain their ditches and canals to accept runoff. Calculations indicate existing drainage structures in the area are insufficient to pass the 100-year flood runoff without overtopping the highway traveled way. The specific issues at each crossing are covered in more detail in the Preliminary Drainage Report for the project.

2.9.2.2 Floodplains

The project crosses a defined Federal Emergency Management Agency (FEMA) floodplain at the location where Thurston Creek crosses SR 281, approximately 330 feet north of SR 29 (Figure 2.9-2). East of SR 281, the 100-year floodplain widens and intersects a portion of the SR 29 embankment at PM 27.23 where Thurston Creek crosses SR 29.

2.9.3 Impacts

The proposed project would modify the roadside drainage and raise the roadway grade, where needed, along SR 29 to accommodate the widened highway facility and the 100-year flood. Where SR 281 crosses Thurston Creek, the capacity of the existing culverts will be increased. Along SR 29, additional culverts will be added, and existing culverts will be repaired or upgraded as necessary to add flow capacity across the highway and decrease the flood elevation at the highway.

2.9.3.1 Temporary and Construction Impacts

No Build Alternative

The No Build Alternative would not change the current highway and would have no impacts on hydrology or floodplains in the project area.

All Build Alternatives

Temporary channel obstructions may be expected to occur during construction, but all work in the channels such as the Thurston Creek crossing would typically occur during the dry season (June 15 to October 15).

2.9.3.2 Permanent Impacts

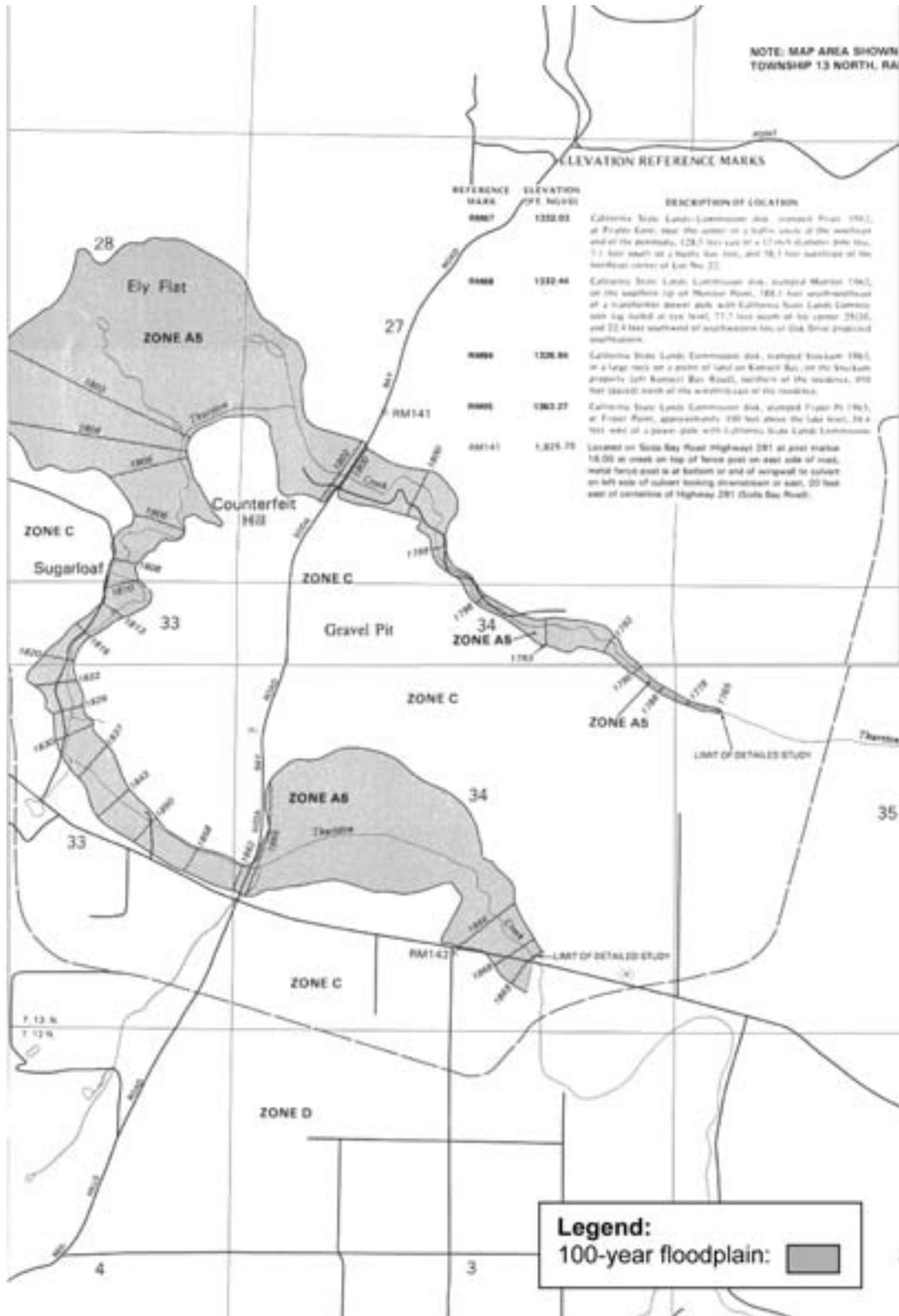
No Build Alternative

The No Build Alternative would not improve the roadway and would not result in any permanent impacts on hydrology or floodplains.

All Build Alternatives

Project-Related Flood Risk

With the build alternatives, proposed improvements to SR 29 over Thurston Creek are within the FEMA-defined 100-year floodplain, as shown on Figure 2.9-2. However, the risks associated with the implementation of these alternatives are minimal. Flooding from Thurston Creek has been analyzed by FEMA for the stream reach downstream of SR 29. Hydraulic modeling conducted by FEMA for the Lake County Flood Insurance Study using the United States Army Corps of Engineers' (USACE's) HEC-RAS computer model included the culvert crossings of SR 29 and a short reach upstream to properly model the highway culvert crossing. The existing 100-year flood elevation is above the elevation of the existing road. However, the proposed project would modify the roadside drainage and raise the roadway grade, where needed, along SR 29 to accommodate the widened highway facility and the 100-year flood. Where SR 281 crosses Thurston Creek, the capacity of the existing culverts will be increased.



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Lake 29 Improvement Project

FEMA Flood Insurance Rate Map for Thurston Creek

Figure 2.9-2

Floodplain Encroachment

As defined by FHWA, a longitudinal floodplain encroachment is an action within the limits of the base floodplain that is longitudinal or parallel to the direction of flow.

As defined by FHWA, a significant¹⁸ floodplain encroachment is a highway encroachment and any direct support of likely base floodplain development that would involve one or more of the following construction or flood-related impacts: (1) a significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route; (2) a significant risk; or (3) a significant adverse impact on the natural and beneficial floodplain values. The proposed project would not be considered a significant floodplain encroachment. The improvements that are a part of this project would not significantly increase the existing depth or limits of flooding.

Incompatible Floodplain Development

The proposed build alternatives would not support any incompatible floodplain development. Each of the build alternatives proposes to widen SR 29 to a four-lane divided expressway with access control. This project is not intended to encourage additional development in Lake County, and the addition of excess capacity to SR 29 is not likely to dramatically alter development patterns in this area, primarily because there is no indication that a lack of capacity is currently constraining development.

Impacts on Natural and Beneficial Floodplain Values

Natural and beneficial floodplain values in the project area include but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

The impacts of each of the build alternatives on the natural and beneficial floodplain values would be similar and are expected to be minimal. The uses of the existing floodplain lands include vineyards and fallow, undeveloped land in the project area west of SR 281/Red Hills Road. The only physical impact to the floodplain would be the new footprint of the highway widening, which would include additional culverts. The movement of fish that may exist in Thurston Creek would not be impeded by the existing or proposed crossing of SR 281. At the SR 29 crossing, a drop of less than approximately 2 feet exists at the downstream end of the culvert.

¹⁸ The use of "significant" in this section is consistent with the *Federal-Aid Highway Program Manual* (FHWA 1979) definition for floodplain encroachment and is not used with regard to NEPA.

2.9.4 Avoidance, Minimization, and Mitigation Measures

No avoidance, minimization, or mitigation measures are required.

2.10 Water Quality and Storm Water Runoff

2.10.1 Regulatory Setting

Section 401 of the Clean Water Act (CWA) requires water quality certification from SWRCB or from a Regional Water Quality Control Board (RWQCB) when the project requires a CWA Section 404 permit to dredge or fill within a water of the United States.

Along with CWA Section 401, CWA Section 402 establishes the National Pollutant Discharge Elimination System (NPDES) permit for the discharge of any pollutant into waters of the United States. The federal Environmental Protection Agency has delegated administration of the NPDES program to the SWRCB and nine RWQCBs. The SWRCB and RWQCB also regulate other waste discharges to land within California through the issuance of waste discharge requirements under authority of the Porter-Cologne Water Quality Act.

The SWRCB has developed and issued a statewide NPDES permit to regulate storm water discharges from all Caltrans activities on its highways and facilities. Caltrans construction projects are regulated under the Statewide permit, and projects performed by other entities on Caltrans right of way (encroachments) are regulated by the SWRCB's Statewide General Construction Permit. All construction projects require a Storm Water Pollution Prevention Plan (SWPPP) to be prepared and implemented during construction.

2.10.2 Affected Environment

2.10.2.1 Climate, Topography, and Soils

The project area experiences a warm temperate (mesothermal) climate characterized by dry summers with little or no precipitation from June to September. The terrain surrounding the project area is mostly rolling to mountainous and interspersed with small valleys and basins. The majority of the project lies within the Thurston Creek watershed, a closed drainage basin created by a lava flow that dammed the creek, creating Thurston Lake. The approximate elevation of SR 29 is 1,900 feet, and Thurston Lake, to the northeast, lies at 1,400 feet.

The project area consists of uplifted and dissected hills of volcanic origin. Typically the soils within the entire project vicinity are moderately deep to very deep and well drained. Textures range from cobbly loam to very stony loam on the eastern half of the project and from very gravelly loam to extremely gravelly sandy loam on the western half.

2.10.2.2 Surface Water

The project limits lie within three closed drainage basins separated by low ridges. The primary drainage basin in the project area is the Thurston Creek drainage basin. About 75 percent of the project area is within this basin. Thurston Creek originates in the mountains just to the south of the project area. The intermittent creek meanders extensively in a generally south-to-north direction through the project area before turning toward the east and terminating at Thurston Lake.

The secondary drainage basin within the project area is a closed drainage basin consisting of Shaul Valley and the surrounding hills. Intermittent and ephemeral flows in this basin are collected by a small, unnamed drainage that flows north and eventually dissipates throughout the floor of the valley.

The third drainage basin is the Pinkeye Lake drainage basin at the eastern end of the project area. This closed drainage basin is separated from the Thurston Lake drainage basin by Roundtop Mountain (elevation 2,284 feet). Water flowing from impervious surfaces east of Diener Drive within the ESL flows into this closed drainage basin, and represents about 1 percent of flow in the ESL.

Surface water in the general vicinity of the project area also includes Clear Lake, the largest natural freshwater lake entirely within the borders of California, which lies approximately 1.5 miles north of Thurston Lake. Thurston Lake and Clear Lake are separated by a volcanic ridge and are not connected by surface waters.

Quality of Existing Surface Waters

No surface water quality data exist for Thurston Creek, Thurston Lake, or other water bodies within the Thurston Lake watershed. Agencies that have jurisdiction over water resources in the project area include the East Lake Resource Conservation District, the Central Valley RWQCB, the Lake County Water Resources Division, and the California Department of Water Resources (DWR) Northern District. The RWQCB has not designated any beneficial uses in the Basin Plan (RWQCB 1998) for Thurston Lake.

Existing Road Maintenance

Caltrans applies traction sand to SR 29 intermittently throughout the year for ice/frost control. The amount of sand applied ranges between 100 and 300 pounds per lane mile. The application of sand is often concentrated in certain areas on the road to reduce driving hazards. After the sand is applied, it is allowed to disperse onto the roadside and a portion is collected by pickup brooms and/or ditch cleaning operations.

2.10.2.3 Groundwater Resources

No groundwater data are available for the immediate project area. Most of the groundwater underlying the Thurston Lake watershed is not included in any of the groundwater basins mapped by DWR. However, approximately 0.5 mile of the western end (PM 31.1 to 31.6) of the project area is included in the Kelseyville Groundwater Basin, a 30-square-mile basin drained by Adobe Creek (SWRCB 2003). Private wells are located within and around the project area, including a small community along SR 281 (Soda Bay Road) to the north. However, no public supply of water from wells is provided within or in the immediate vicinity of the project area.

Wellhead Protection

Wellhead protection is a preventive program designed to protect public water supply wells. Because the proposed project is in an area that does not have a public water supply from groundwater wells, planning for wellhead protection is not necessary.

Groundwater Quality

Groundwater throughout the majority of the project area, excluding the small portion of the project that overlies the Kelseyville Basin, has not been monitored by a public agency primarily because no monitoring wells lie within a groundwater basin designated by DWR. Groundwater in the Kelseyville Basin is used for intensive irrigation, domestic, and industrial purposes.

2.10.3 Impacts

2.10.3.1 Temporary and Construction Impacts

No Build Alternative

The No Build Alternative would not change the current highway and would have no temporary or construction impacts on water quality or storm water runoff.

All Build Alternatives

Project-related construction activities would potentially have adverse water quality impacts. Construction-related impacts would be similar for Alternatives C1, C2, C3, and D.

Surface Water

During construction, there is the potential for increased erosion, and storm water runoff carrying sediments could drain into Thurston Creek or other drainages. Soil erosion could, especially during heavy rainfall, increase suspended solids, dissolved solids, and organic pollutants in nearby creeks. These conditions could persist until completion of construction activities and implementation of landscaping and other long-term erosion control measures.

Accidental spills of petroleum hydrocarbons such as fuels and lubricating oils, concrete wastewater, other potentially toxic materials, and possibly sanitary wastes are also a concern during construction activities. The magnitude of the impact from an accidental release would depend on the amount and type of material spilled.

Groundwater

No construction-related groundwater impacts are expected because the project does not involve substantial excavations that would affect groundwater resources.

2.10.3.2 Permanent Impacts

No Build Alternative

The No Build Alternative would not change the current highway and would have no permanent impacts on water quality or storm water runoff.

All Build Alternatives

Permanent impacts could potentially result from the following two sources: sediment carried by storm water from project-related erosion and vehicle-related toxic pollutants carried in storm water runoff. These potential permanent impacts apply to all of the build alternatives (C1, C2, C3, and D).

Surface Water

Storm water runoff volumes from the project area would increase with the implementation of the project due to the increase in impervious surfaces. However, this additional runoff is not anticipated to exceed the capacity of drainage systems in the area. The FHWA has found that street and highway storm water runoff can, in some instances, adversely affect receiving water quality. The nature of these impacts

would depend on the uses and flow rate or volume of the receiving water, rainfall characteristics, and street or highway characteristics. In general, heavy metals associated with vehicle tire and brake wear, oil and grease, and exhaust emissions are the primary toxic pollutants associated with transportation corridors.

Sanding of the road during winter months may adversely affect water quality in the project area due to increased sediment loads in storm water runoff. Under the build alternatives, the amount of sand currently spread may double due to the increased amount of paved area under these alternatives.

Groundwater

At this time, the project is not anticipated to involve substantial excavations that could affect groundwater resources, although some surface excavation would occur during construction. Near the eastern end of the project area, several hills would require steep cuts. It is unknown if groundwater would be encountered during excavation of these cuts. Section 2.10.4.1 presents avoidance and minimization measures that will be undertaken if groundwater is encountered during excavation.

Groundwater resources in the area do not represent a sole source aquifer, so no impacts are expected to occur to water quality in groundwater wells.

2.10.4 Avoidance, Minimization, and Mitigation Measures

2.10.4.1 Avoidance and Minimization Measures

Impacts to water resources will be avoided or minimized by adherence to the statewide storm water permit requirements and the implementation of temporary and permanent Best Management Practices (BMPs), as applicable.

Construction-Related Minimization

Erosion control measures will be applied to all exposed areas during construction. Erosion control BMPs are described in the Caltrans Project Planning and Design Guide (Caltrans 2002b). Because the proposed project will involve a soil disturbance of more than 1 acre, Caltrans will adhere to the conditions of the NPDES permit for construction activities (Order No. 9-08-DWQ, NPDES No. CAS000002), which is incorporated by reference into the Caltrans NPDES permit for storm water discharges from the State of California (Order No. 99-06-DWQ, NPDES No. CAS000003). Filing of a Notice of Intent is not required, as this has been replaced by a Notification of Construction under the Caltrans NPDES permit. To comply with the conditions of the Caltrans NPDES permit and to address the temporary water quality impacts

resulting from the construction activities associated with this project, Caltrans will require a SWPPP from its Contractor. To avoid contaminating waterways or groundwater, additional water quality, erosion, and hazardous waste provisions may also be required in construction contract and/or in Caltrans Standard Specifications and Standard Special Provisions. The SWPPP will address the construction-phase impacts and will include the following elements: Project Description; Minimum Construction Control Measures; Erosion and Sediment Control; Non-Storm Water Management; Post-Construction Storm Water Management; Waste Management and Disposal; Maintenance, Inspection, and Repair; Annual Reporting to RWQCB; and Training.

If groundwater is encountered during any excavations, the Caltrans Office of Environmental Engineering will be contacted regarding the handling and disposal of this water. If this water will be discharged into any jurisdictional waters, appropriate dewatering procedures will be required to reduce or eliminate any potential discharge of pollutants to the maximum extent feasible. A project-specific Waste Discharge Permit may be required from the RWQCB if substantial dewatering will take place. In the event that this project would affect groundwater, the groundwater will be tested for potential contamination, and a Special Provision will be prepared, if applicable, to ensure the proper handling and disposal of the groundwater.

Post-Construction Minimization

Permanent control measures to reduce pollutants in storm water runoff from the roadway will be implemented, as required, to reduce suspended particulate loads (and thus pollutants associated with the particulates) entering drainages. These measures will be incorporated into the final engineering design or landscape design of the project.

2.10.4.2 Mitigation Measures

No further mitigation is required beyond the avoidance and minimization measures discussed above.

2.11 Geology/Soils/Seismic/Topography

2.11.1 Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects

“outstanding examples of major geological features.” Geologic and topographic features are also protected under CEQA.

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

2.11.2 Affected Environment

2.11.2.1 Regional Setting

The project area is located in the northern Coast Ranges geomorphic province. This region is located on the boundary between the North American and Pacific tectonic plates. The Pacific plate is moving northwest relative to the North American plate across a boundary oriented in a north-northwest direction that is approximately 60 miles wide. This zone encompasses all of the major active faults in Northern California. The average relative motion across this plate boundary amounts to 1.4 to 1.5 inches per year, with the majority of this motion occurring during large earthquakes (WGCEP 2003). Seismically, this region is one of the most active in the world, highlighted by the number of large, damaging earthquakes that have occurred during historical time.

2.11.2.2 Site Geology

The project site is located within the Clear Lake volcanic field, south of Clear Lake, in Lake County. Types of rock found in the project area include dacite, andesite, obsidian, basalt, tuff and other pyroclastic rock, and rhyolite (Wagner and Bortugno 1982). Alluvium (sedimentary material deposited by flowing water) is found primarily in low-lying areas such as Manning Flat and Shaul Valley. The nearby terrain is mountainous, with elevations ranging from approximately 2,000 to 2,300 feet.

The project area traverses about 10 different soil types, ranging from clayey loam to gravelly sandy loam (SCS 1983). The permeability values of these soils range from low to very high.

Borings collected at Seigler Creek Bridge (PM 20.37), outside of the project ESL to the east, indicate that the near-surface material at that location consists of medium-dense to dense sand, silt, and gravel underlain by weathered sandstone and shale. Similar samples collected at Kelsey Creek Bridge (PM 34.97), outside of the project ESL to the west, indicate that the near-surface material consists of medium dense to dense sand, silt, and gravel with cobbles underlain by medium-stiff to stiff clayey silt. Within the wetland areas, the majority of the underlying soils are expected to consist of silts and sands with some clay.

2.11.2.3 Geologic Hazards

Surface Fault Rupture

Surface fault rupture is defined as a slip on a fault plane that offsets or disturbs the earth's surface. Offset on a fault at the ground surface can create a discrete step or fault scarp if fault slip occurs on a single fault plane or within a narrow fault zone. If fault slip occurs over a broader area, then the result may be a zone of fracturing and ground cracking.

The State of California delineates zones around active faults under the Alquist-Priolo Earthquake Fault Zone Act (Hart 1994) to mitigate for the effects of surface faulting. The state defines an active fault as a fault showing evidence for rupture during the Holocene (the last 11,000 years). The proposed project area is in a region of numerous faults that are zoned as active faults by the State of California, with many faults trending toward and two faults crossing the project corridor (CDMG 2000). Therefore, the potential for surface rupture due to fault movement in the project area is considered to be likely during the lifetime of the project.

Earthquake Shaking

Strong earthquake ground shaking is likely the most important seismic hazard that can be expected in this area. Based on the Caltrans California Seismic Hazard Map, the main fault in the project area is the Konocti Bay fault. Based on the reference map, the peak bedrock acceleration at the project area is estimated to be 0.6g (acceleration equivalent to 60 percent of the force of gravity).

Liquefaction and Lateral Spreading

Liquefaction is a loss of soil strength and stiffness that can occur during an earthquake. Liquefaction typically occurs in loose, cohesionless, saturated, granular soils below the groundwater table and can cause rapid settlement of the soils. Based on published geological mapping of soil types and on reported field observations and

groundwater observations, potential for liquefaction may exist along portions of the project corridor.

Subsidence

Land surface subsidence can result from both natural and human-made phenomena, including earthquake-induced liquefaction, soil consolidation, and groundwater extraction (e.g., lowering the groundwater table). Within wetland areas, the majority of the underlying soils are expected to consist of soft or loose silts and sands with some clay, which may be subject to subsidence. Measures to minimize subsidence may be needed in these areas and would be determined by subsurface investigation.

Expansive Soils

Soils that expand and shrink due to wetting and drying are considered to be expansive soils. The seasonal expansion and shrinking of these soils can result in ground movements that can damage roadways and structures that are not appropriately designed. Soils with high shrink-swell potential were only found at Manning Flat, in the eastern section of the project area (SCS 1983).

Landslides

A landslide is the downward movement of soils and rock under gravity and includes rockfalls, and debris flows. Landslides require source materials, a slope, and a triggering mechanism. Source materials include fractured and weathered bedrock and unconsolidated materials. Triggering mechanisms include earthquake shaking, heavy rainfall, and erosion.

Earth flows are slow moving landslides that can pose serious hazards to property in the hillside terrain of the Coast Ranges. Earth flows deform and tilt the ground surface when they move and are caused by such changes as increased water content, earthquake shaking, addition of load, or removal of downslope support. The result can be destruction of foundations, offset of roads, and breaking of underground pipes within and along the margins of the landslide, as well as overriding of property and structures downslope. Since they tend to move slowly, they rarely threaten life directly.

The hilly nature of the project vicinity indicates that landsliding may be possible. Landsliding could also potentially occur along project cut slopes if they are not properly designed.

Shallow Groundwater

According to several borings collected in the area (Caltrans 2006c), the true groundwater table is deeper than 20 feet, but in some areas there is a perched water table¹⁹ as shallow as 10 feet below the ground surface.

2.11.3 Impacts

2.11.3.1 Temporary and Construction Impacts

No Build Alternative

The No Build Alternative would not modify SR 29; therefore, no temporary or construction impacts would occur.

All Build Alternatives

During construction, increased erosion of exposed soils could occur. In addition, the proposed construction may temporarily result in changes to the surface soil moisture content, which could result in temporary shrink or swell behavior of the soil.

2.11.3.2 Permanent Impacts

No Build Alternative

The No Build Alternative would not modify SR 29; therefore, no geologic impacts would occur.

All Build Alternatives

All of the build alternatives would be similar with respect to potential geological impacts.

Fault Rupture

The construction of the proposed project is not expected to affect the surface fault rupture hazard for the project area.

Earthquake Shaking

The construction of the proposed project is not expected to affect regional ground shaking.

Liquefaction and Lateral Spreading

The construction of the proposed project is not expected to cause any liquefaction or lateral spreading.

¹⁹ A perched water table is an aquifer that occurs above the main water table due to the presence of an impermeable layer of rock above the main aquifer but below the surface.

Subsidence

The introduction of loads either during the construction phase or directly from the reconstruction of the road could cause minimal consolidation of the surface soils.

Expansive Soils

Soils with high shrink-swell potential may be found within the area of Manning Flat, in the eastern portion of the project area. Construction of the roadway on expansive soils could damage the roadway due to the expansion and shrinking action that can result in differential ground movements.

Landsliding

Construction of the proposed build alternatives could potentially initiate landsliding if not implemented properly. Cut slopes constructed for this project may be subject to minor landsliding or slumping if cut too steeply.

2.11.4 Avoidance, Minimization, and Mitigation Measures

2.11.4.1 Avoidance and Minimization Measures

In order to avoid or minimize geohazard risks and impacts, the design and construction of the project will adhere to state codes and criteria. The engineering design for the proposed project will be carried out in accordance with Caltrans Seismic Design Criteria.

Roadways and bridges will be designed and constructed to the seismic design requirements for ground shaking specified in the Uniform Building Code for Seismic Zone 3.

To satisfy the provisions of the California Building Code, the proposed facilities will be designed to withstand ground motions equating to approximately a 500-year return period (10 percent probability of exceedance in 50 years). Bridges will be designed in accordance with the latest Caltrans Seismic Design Criteria.

Additionally, the following geological hazard avoidance and minimization measures will be included in the design and construction of the proposed build alternatives. These measures will apply to whichever build alternative is selected. These recommendations are based on the preliminary studies conducted to identify the geologic conditions and impacts of the proposed project. A geologic and geotechnical investigation of the alignment of the preferred alternative and laboratory testing of the earth materials will be conducted during the final design phase.

Fault Rupture and Earthquake Shaking

If any structures are planned at locations where Alquist-Priolo zoned faults cross the alignment, trenches will be excavated to allow for subsurface evaluation of faulting. Where evidence of recent faulting is identified, site-specific measures will be required, including, but not limited to, bridge and foundation design that can withstand anticipated offset and ground shaking.

Liquefaction

Site-specific exploratory borings and laboratory testing during final design of any bridge structures will be conducted to delineate any potentially liquefiable materials. Potentially liquefiable materials will either be removed or engineered to reduce their liquefaction potential, or the engineering design will incorporate deep foundations that extend beyond soils with the potential for liquefaction.

Subsidence

Potential surface deformation resulting from subsidence could be minimized by periodic repair to the road surface, curbs, and other engineered facilities. Annual inspection will be carried out to assess ongoing subsidence damage to the roadway.

Expansive Soil

Site-specific borings and testing will include identification of soils with high shrink-swell potential that could damage the roadway over time. Expansive soils will be overexcavated and replaced with nonexpansive fill or treated with appropriate soil amendments to reduce the potential for shrinking and swelling.

Landsliding

The soils in the vicinity of project cut slopes will be analyzed based on laboratory strength data from soil borings collected during final design. The data will facilitate appropriate slope design. Appropriate slope strengthening and stabilizing design measures will be developed if deemed necessary.

Erosion

Soil and slope stability measures will prevent or reduce erosion. Erosion of soils during construction will be minimized using temporary hydroseeding to provide a vegetation cover with straw bales, plastic sheeting slope cover, and temporary drainage measures to prevent excessive slope runoff.

2.11.4.2 Mitigation Measures

No further mitigation is required beyond the avoidance and minimization measures discussed above.

2.12 Hazardous Waste/Materials

2.12.1 Regulatory Setting

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

The primary federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act of 1976 and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (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. The Resource Conservation and Recovery Act provides for “cradle to grave” regulation of hazardous wastes from their generation to their final disposal. Other federal laws include:

- Community Environmental Response Facilitation Act of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act
- Atomic Energy Act
- Toxic Substances Control Act
- Federal Insecticide, Fungicide, and Rodenticide Act

In addition to the laws 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 response 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 handling or disposal of hazardous material is vital if it is generated or disturbed during project construction.

2.12.2 Affected Environment

The Caltrans Hazardous Waste Office completed an Initial Site Assessment (ISA) in 1999. This was followed by a Supplemental ISA in August 2002, a second Supplemental ISA in March 2003, and a final Supplemental ISA in April 2006. These assessments involved field inspections to identify existing land uses for potential hazardous waste sites or materials. A search of regulatory databases containing information on known hazardous waste sites was also conducted for this project. The database search area consisted of a 1-mile radius around the study area. In addition, a search of regulatory agency files, published government documents, current aerial photographs, Sanborn Fire Insurance Maps, and other sources provided additional information on known hazardous waste sites in or near the project area and past land uses that might indicate the presence of hazardous materials.

The records search of regulatory agency databases identified no recorded active hazardous materials sites within the project area.

2.12.2.1 Potential Hazardous Materials Sites

Historical land uses adjacent to SR 29 have included a variety of agricultural, residential, and commercial uses. Though no sites with active hazardous materials issues were listed in the records search, several commercial or light industrial sites in the project area could potentially contain hazardous materials and/or underground storage tanks due to the nature of the uses occurring on these sites. This might include properties such as the PG&E substation and the gasoline station at Kit's Corner (both near the SR 29/281/Red Hills Road intersection), as well as Amber Knolls Orchard, Kelseyville Auto Salvage and Towing, and quarries located in the project area. Near the western end of the project is the Benson Ridge Facility, which is a closed hazardous waste management facility that is regulated by the Department of Toxic Substances Control and RWQCB. During closure, wastes stored at this facility were placed in specially designed Waste Consolidation Areas and capped with a cover system to prevent water infiltration. This facility is outside of the ESL for this project.

2.12.2.2 Building Demolition

Hazardous materials could also potentially be encountered during building demolition. The proposed build alternatives would require the removal of one or more buildings. Buildings constructed more than 20 years ago may contain asbestos containing materials and/or lead-based paint. The demolition of any structures as a part of the proposed project could result in the release of airborne asbestos, if asbestos is present in the structure.

2.12.2.3 Naturally Occurring Asbestos and Aerially Deposited Lead

Naturally occurring asbestos (NOA) and aerially deposited lead may be encountered during excavation of soils during construction.

Naturally occurring asbestos is found sporadically throughout Lake County soils. Geologic maps created by the California Division of Mines and Geology indicate serpentine soil north of Clear Lake and in southern Lake County and possibly within the project limits. There also exists the possibility of wind-blown debris, eroded debris, or deposited soil due to maintenance operations within the areas of project excavations.

There is the potential for aerially deposited lead from vehicle exhaust to be present in shallow soils near roadways in the project area. If asbestos or lead are found, soils near the roadways could be classified as a hazardous waste once excavated, and special soil management and disposal and/or construction worker health and safety measures may be required during project construction.

2.12.3 Impacts

2.12.3.1 Temporary and Construction Impacts

No Build Alternative

Alternative A, the No Build Alternative, would not result in grading or excavation of soils or the removal of buildings within the project limits, thus there would be no potential to encounter hazardous materials.

All Build Alternatives

No recorded active hazardous materials sites were found within the ESL for the build alternatives. However, unknown or unrecorded substances may exist and would need to be investigated prior to project construction. In addition, aerially deposited lead or naturally occurring asbestos may be encountered during earth moving operations, and lead paint or asbestos may be encountered during demolition of buildings. All of the

build alternatives (Alternatives C1, C2, C3, and D) would have similar potential to encounter unrecorded hazardous materials.

The hazardous materials expected to be used during project construction include gasoline, diesel fuel, oil, and lubricants for operation of construction equipment. These materials are typically used, handled, and stored by contractors on all roadway construction projects. Contractors are required to handle hazardous materials in accordance with applicable laws, including health and safety requirements. No acutely hazardous materials would be used or stored on-site during construction.

Construction of the proposed build alternatives could potentially result in small fuel spills from construction or vehicles.

Potential hazardous material impacts relating to storm water runoff and groundwater are discussed in greater detail in Section 2.10.3.

2.12.3.2 Permanent Impacts

No Build Alternative

The No Build Alternative would not result in any permanent impacts.

All Build Alternatives

Potential impacts would only occur during soil-disturbing activities in the construction phase. No permanent impacts are expected.

2.12.4 Avoidance, Minimization, and Mitigation Measures

2.12.4.1 Avoidance and Minimization Measures

The routine use of hazardous materials, such as gasoline or diesel fuel for construction equipment, will be required by the project. Equipment to clean up fuel leaks and spills will be available at each project construction location. The Contractor will be required to safely store materials and immediately clean up spills if they occur.

Naturally occurring or currently existing hazardous materials will require further investigation in order to avoid or minimize impacts. Since unrecorded hazardous materials could be encountered during construction, the following measures will reduce impacts related to hazardous substances:

- Alternative D would not require the relocation of the PG&E substation. It is likely that the need for relocation of the substation will be avoided during final design of

- Alternatives C1, C2, and C3 as well. However, should project plans eventually call for the relocation of the PG&E substation, a site-specific investigation for polychlorinated biphenyls (PCBs) will be conducted. If PCB-contaminated soil is confirmed, cleanup procedures will be implemented after relocation. If right of way is purchased from PG&E but the substation is not relocated, cleanup procedures will not be necessary.
- For alternatives that require the acquisition of structures, Caltrans will complete an asbestos-containing material survey and lead-based paint survey prior to demolition activities. Caltrans will obtain a National Emission Standards for Hazardous Air Pollutants (NESHAP) permit, which is required for demolition, from the Lake County Air Quality Management District. Asbestos inspections for the NESHAP permit will be conducted by California Occupational Safety and Health Administration (Cal/OSHA)–certified inspectors. Regulated asbestos-containing materials will be identified during the survey and noted on the NESHAP permit. Caltrans will have all regulated asbestos-containing materials abated by licensed asbestos contractors prior to demolition.
 - If any lead-based paint is discovered, abatement procedures will be enforced during demolition.
 - All suspected abandoned underground storage tank sites will require a ground-penetrating radar search prior to construction to determine the presence or absence of underground tanks. Should any underground tanks be discovered, proper removal, cleanup, and disposal will take place prior to or during construction activities.
 - An investigation for NOA will be completed for the preferred alternative. If present, or if discovered during construction, remediation activities in accordance with all applicable local, state, and federal regulations will be implemented.

Prior to construction, a more detailed site investigation will be performed within the existing and proposed right of way for the preferred alignment, including drilling of test holes and collection and laboratory analysis of soil and/or water samples. Results of the testing will help to determine if there is a need to manage excavated or graded soils potentially contaminated with lead from vehicle exhaust, naturally occurring asbestos, or other organic or inorganic chemicals that might be present due to commercial or light industrial land uses. Completion of these studies prior to construction will be necessary to ensure that worker health is protected and that construction activities are conducted in compliance with existing hazardous materials laws and regulations. Prior to commencing the study, Caltrans will prepare a Health

and Safety Plan that addresses the potential effects of the various chemical compounds that could be encountered at each property. The Health and Safety Plan will include evaluations of the suspected chemical hazards, including symptoms of exposure and emergency treatment, appropriate use of personal protection equipment, and air monitoring.

2.12.4.2 Mitigation Measures

No further mitigation is required beyond the avoidance and minimization measures discussed above.

2.13 Air Quality

2.13.1 Regulatory Setting

The Clean Air Act as amended in 1990 is the federal law that governs air quality. Its state counterpart is the California Clean Air Act of 1988. These laws set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter, lead, and sulfur dioxide (SO₂). Table 2.13-1 lists federal and state air quality standards.

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

The Lake County Air Quality Management District has jurisdiction over air quality in the Lake County Air Basin and regulates most air pollutant sources except for motor vehicles, locomotives, aircraft, agriculture equipment, and marine vessels. The Lake County Air Basin is currently classified by the United States Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) as being in attainment for all regulated criteria pollutants, therefore conformity requirements do not apply to this project.

Table 2.13-1 Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards ¹		Federal Standards ²			
		Concentration ³	Method ⁴	Primary ^{5,6}	Secondary ^{5,6}	Method ⁷	
Ozone (O ₃)	1 Hour	0.09 ppm (180 µg/m ³)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry	
	8 Hour	0.070 ppm (137 µg/m ³)		0.08 ppm (157 µg/m ³)			
Respirable Particulate Matter (PM ₁₀)	24 Hour	50 µg/m ³	Gravimetric or Beta Attenuation	150 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis	
	Annual Arithmetic Mean	20 µg/m ³		—			
Fine Particulate Matter (PM _{2.5})	24 Hour	No Separate State Standard		26 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis	
	Annual Arithmetic Mean	12 µg/m ³	Gravimetric or Beta Attenuation	15 µg/m ³			
Carbon Monoxide (CO)	8 Hour	3.0 ppm (10 mg/m ³)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m ³)	None	Non-Dispersive Infrared Photometry (NDIR)	
	1 Hour	20 ppm (23 mg/m ³)		35 ppm (40 mg/m ³)			
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m ³)		—			
Nitrogen Dioxide (NO ₂) [*]	Annual Arithmetic Mean	0.030 ppm (56 µg/m ³)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m ³)	Same as Primary Standard	Gas Phase Chemiluminescence	
	1 Hour	0.18 ppm (308 µg/m ³)		—			
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	—	Ultraviolet Fluorescence	0.030 ppm (80 µg/m ³)	—	Spectrophotometry (Parosamine Method)	
	24 Hour	0.04 ppm (105 µg/m ³)		0.14 ppm (365 µg/m ³)			
	3 Hour	—		—			0.5 ppm (1300 µg/m ³)
	1 Hour	0.25 ppm (605 µg/m ³)		—			—
Lead ⁸	30 Day Average	1.5 µg/m ³	Atomic Absorption	—	—	—	
	Calendar Quarter	—		1.5 µg/m ³			Same as Primary Standard
Visibility Reducing Particles	8 Hour	Extraction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards			
Sulfates	24 Hour	25 µg/m ³	Ion Chromatography				
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m ³)	Ultraviolet Fluorescence				
Vinyl Chloride ⁸	24 Hour	0.01 ppm (26 µg/m ³)	Gas Chromatography				

Source: CARB 2007.

* The NO₂ ambient air quality standard was amended on 2/22/07 to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

1. California standards for O₃, carbon monoxide (except Lake Tahoe), SO₂ (1 and 24 hour), NO₂, suspended particulate matter—PM₁₀, PM_{2.5}, and visibility reducing particles—are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in 17 CCR Section 70200.

2. National standards (other than O₃, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O₃ standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For PM_{2.5}, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact USEPA for further clarification and current federal policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent procedure that can be shown to the satisfaction of CARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by USEPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by USEPA.

8. The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

2.13.2 Affected Environment

2.13.2.1 Climate, Meteorology, and Topography

The proposed project is located in the Lake County Air Basin, in the northern portion of California's Coast Ranges. The climate of the region is characterized by hot, dry summers and cool, wet winters. The region is often much cooler than the nearby Central Valley, with a climate similar to that of the North Coast region in inland areas.

Due to the sheltering effect of the surrounding mountains, winds in the region are generally light. Throughout the year and especially during the summer, winds are generally from the northwest. Low average wind speeds typically result in minimal atmospheric mixing and pollutant dispersion during the months of August and September. During the fall, periods of light winds combine with clear skies and well-developed temperature inversions. During the winter, winds are most variable, leading to favorable ventilation conditions. Similarly, during the spring, chilly temperatures result in atmospheric instability that gives rise to vertical mixing of the air.

2.13.2.2 Existing Air Quality in Lake County Air Basin

As noted above, the Lake County Air Basin is currently classified by USEPA and CARB as being in attainment for all regulated criteria pollutants, meaning that the air pollutant concentrations in the air basin achieve the national and state ambient air quality standards. The Lake County Air Basin is the only air basin in the state that is in attainment of all standards. Due to this attainment status, conformity to the federal Clean Air Act does not need to be demonstrated for transportation projects in the air basin, and the Lake County Air Quality Management District is not required to prepare or implement a plan to achieve emissions reductions to comply with the California Clean Air Act.

Existing air quality conditions in the project area can be characterized by the monitoring data collected at the Lakeport Boulevard monitoring station in Lakeport, approximately 9.3 miles from the project area. For the past three years, this station has monitored O₃ and particulate matter with a diameter of 2.5 micrometers or smaller. No violations of the national or state ambient air quality standards for these pollutants were recorded at this monitoring station during this time period. The other criteria pollutants are not of concern in the Lake County Air Basin at this time and are therefore not monitored.

2.13.3 Impacts

2.13.3.1 Temporary and Construction Impacts

No Build Alternative

Under the No Build Alternative, no construction activities would occur. Therefore, no temporary construction impacts would be expected as a result of implementation of this alternative.

All Build Alternatives

Construction Impacts

The proposed project could result in the generation of short-term construction-related air emissions, including fugitive dust and exhaust emissions from construction equipment. The creation of fugitive dust, specifically particulate matter, would be the primary air quality impact related to construction. Fugitive dust is typically generated during excavation, grading, and hauling activities. Exhaust emissions from diesel-fueled construction equipment can contribute to nitrous oxide and particulate matter emissions during the construction period.

The air quality emissions related to construction activities would vary from day to day depending on the level of construction activity, the specific construction activities, and the prevailing weather. Both fugitive dust and construction equipment exhaust emissions would be temporary and transitory in nature.

Naturally Occurring Asbestos

Naturally occurring asbestos is found sporadically throughout Lake County soils. Geologic maps created by the California Division of Mines and Geology indicate that serpentine soil is present north of Clear Lake and in southern Lake County and possibly within the project limits. There also exists the possibility of wind-blown debris, eroded debris, or deposited soil due to maintenance operations within the areas of project excavations.

2.13.3.2 Permanent Impacts

As described above, the Lake County Air Basin is in attainment of the national and state ambient air quality standards for all criteria pollutants. According to the FHWA Transportation Conformity Reference Guide and the determinations published in 40 CFR Part 93 by USEPA in March 2006, regional and project-level air quality conformity analyses are not necessary for the proposed project because the Lake County Air Basin is not a designated nonattainment or maintenance area. Therefore, there is no need for the proposed project to demonstrate conformity to the State

Implementation Plan. An analysis was conducted to determine whether the proposed build alternatives would result in localized high concentrations of CO. High concentrations of CO due to on-road vehicles are typically a localized occurrence associated with high traffic volumes and heavily congested roadway facilities.

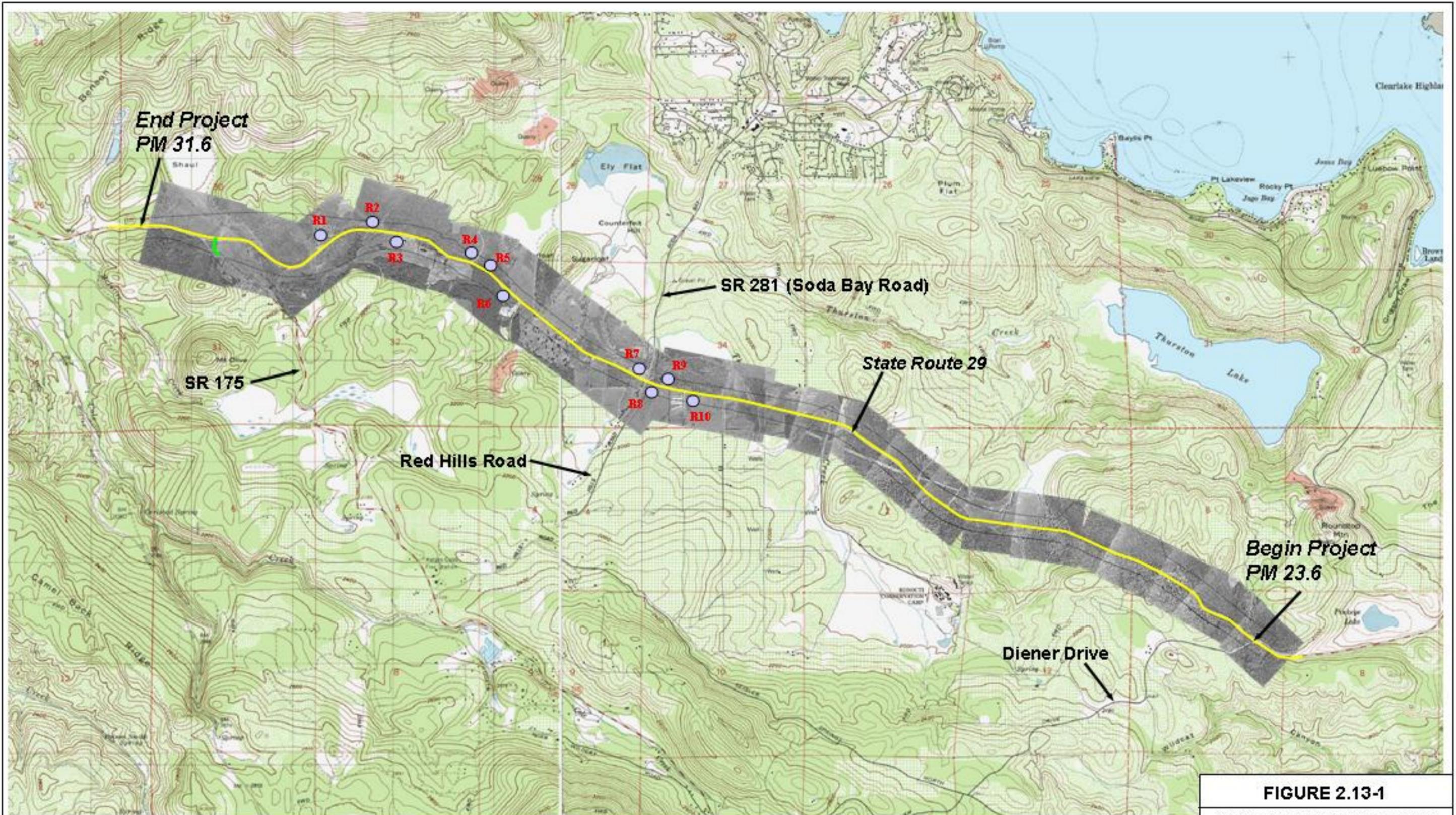
Changes in localized CO concentrations were estimated using CALINE4, a dispersion model for predicting air pollutant concentrations near roadways. Methods for this analysis are reported in detail in the Air Quality Study prepared for this project. Vehicle CO emission rates were generated from CARB's emission factor model EMFAC7 (Version 1.1). The modeling methods used included worst-case assumptions for meteorological conditions, which provided for analysis results that would have conservative conclusions. The changes in localized CO concentrations were modeled at 10 receptor locations (R1 through R10; see Figure 2.13-1), which were placed at the front or side yards of residences and the parking areas of private business buildings along the project area. These receptor locations were determined to demonstrate an adequate sampling of air quality receptors that would be potentially affected by the project. The CO concentrations were estimated for year 2011, 2021, and 2031.²⁰

Summary results of the CALINE4 model for each of the build alternatives are shown in Table 2.13-2.

In addition to the criteria air pollutants for which NAAQS exist, USEPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Mobile source air toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

²⁰ The traffic analysis was recently updated using horizon years 2015, 2025, and 2035. Differences in traffic volumes were slight, ranging from 5 to 11 percent. Because these differences were small, the CO estimates have not been recalculated, but are not expected to be substantially different.



● Air Receptors

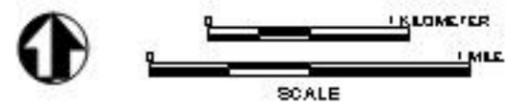


FIGURE 2.13-1
Air Quality Modeling Receptor Locations
 Lake 29 Improvement Project



Source: USGS 7 1/2 minute topographic quadrangle: Kelseyville and Clearlake Highlands, CA

Table 2.13-2 Existing and Projected Carbon Monoxide Concentrations in the Project Area

Receptor Number	Existing Conditions (2002)		No Build Alternative						Alternative C1						Alternative C2						Alternative C3						Alternative D					
			2011		2021		2031		2011		2021		2031		2011		2021		2031		2011		2021		2031		2011		2021		2031	
	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg	1 Hour Avg	8 Hour Avg		
R 1	6.4	4.5	6	4.2	5.9	4.1	6.1	4.3	6	4.2	6	4.2	6	4.2	6	4.2	6	4.2	6.2	4.3	5.9	4.1	5.9	4.1	6	4.2	5.8	4.1	5.8	4.1	5.9	4.1
R 2	6.2	4.3	5.9	4.1	5.8	4.1	6	4.2	6.1	4.3	6.1	4.3	6.2	4.3	6.2	4.3	6.2	4.3	6.3	4.4	5.8	4.1	5.8	4.1	5.9	4.1	6.0	4.2	6.0	4.2	6.1	4.3
R 3	6.7	4.7	6.2	4.3	6.2	4.3	6.3	4.4	5.6	3.9	5.6	3.9	5.6	3.9	5.6	3.9	5.5	3.9	5.6	3.9	5.6	3.9	5.6	3.9	5.7	4	6.2	4.3	6.3	4.4	6.5	4.6
R 4	6.5	4.6	6.1	4.3	6	4.2	6.2	4.3	5.8	4.1	5.8	4.1	5.8	4.1	5.9	4.1	5.9	4.1	6	4.2	5.7	4	5.7	4	5.8	4.1	5.9	4.1	5.9	4.1	6.1	4.3
R 5	7.6	5.3	6.8	4.8	6.8	4.8	7.1	5	6.1	4.3	6.1	4.3	6.1	4.3	6.2	4.3	6.2	4.3	6.3	4.4	5.9	4.1	5.9	4.1	6	4.2	6.3	4.4	6.4	4.5	6.6	4.6
R 6	6.1	4.3	5.8	4.1	5.8	4.1	5.9	4.1	6	4.2	6	4.2	6	4.2	5.8	4.1	5.8	4.1	5.9	4.1	6.3	4.4	6.3	4.4	6.4	4.5	6.4	4.5	6.5	4.6	6.7	4.7
R 7	6	4.2	5.7	4	5.7	4	5.8	4.1	5.9	4.1	5.9	4.1	5.9	4.1	6.2	4.3	6.2	4.3	6.4	4.5	5.7	4	5.7	4	5.8	4.1	5.6	3.9	5.6	3.9	5.7	4.0
R 8	6.6	4.6	6.1	4.3	6.1	4.3	6.2	4.3	5.9	4.1	5.9	4.1	5.9	4.1	5.7	4	5.7	4	5.8	4.1	6.2	4.3	5.9	4.1	6	4.2	6.4	4.5	6.4	4.5	6.6	4.6
R 9	7.4	5.2	6.7	4.7	6.7	4.7	7.1	5	5.8	4.1	5.8	4.1	5.8	4.1	6.1	4.3	6.2	4.3	6.3	4.4	5.7	4	5.7	4	5.7	4	6.2	4.3	6.2	4.3	6.4	4.5
R 10	6.3	4.4	5.9	4.1	5.9	4.1	6	4.2	6.1	4.3	6.1	4.3	6.1	4.3	6	4.2	6	4.2	6.2	4.3	6.2	4.3	6.1	4.3	6.3	4.4	6.2	4.3	6.2	4.3	6.4	4.5

The USEPA is the lead federal agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The USEPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources (66 Federal Register 17229, March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, USEPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline program, its national low emission vehicle standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in vehicle miles traveled, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 to 65 percent, and will reduce on-highway diesel particulate matter emissions by 87 percent.

This EIR/EA includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this EIR/EA. Due to these limitations, see Appendix F for a discussion regarding incomplete or unavailable information in accordance with CEQ regulations (40 CFR Section 1502.22[b]).

No Build Alternative

Carbon Monoxide Operational Impacts

As shown in Table 2.13-2, under the No Build Alternative, localized CO concentrations are predicted to be below the national and state ambient air quality standards of 9 parts per million. Predicted concentrations above 9 parts per million would be considered an adverse impact. The No Build Alternative would not have an adverse impact in terms of causing an exceedance of an air quality standard.

Mobile Source Air Toxics

Under the No Build Alternative, emissions will likely be lower than current levels as a result of USEPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020.²¹ Local conditions may differ from these national projections in terms of fleet mix and turnover, Vehicle Miles of

²¹ Control of Emissions of Hazardous Air Pollutants from Mobile Sources (66 Federal Register 17235).

Travel (VMT) growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

All Build Alternatives

Carbon Monoxide Operational Impacts

Under the proposed build alternatives, localized CO concentrations are predicted to be below the national and state ambient air quality standards of 9 parts per million. Predicted concentrations above 9 parts per million would be considered an adverse impact. None of the proposed build alternatives would have an adverse impact in terms of causing an exceedance of an air quality standard.

Mobile Source Air Toxics

For each alternative in this EIR/EA, the amount of MSATs emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the build alternatives is expected to be nearly the same as that for the No Build Alternative, because the proposed project is not expected to attract a substantial amount of rerouted trips from elsewhere in the transportation network. It is ultimately envisioned that through traffic (including truck traffic) between US 101 and I-5 will use the SR 20 Principal Arterial Corridor around the south shore of Clear Lake; however, no other projects are currently programmed. Although this project is expected to increase the efficiency of the roadway and may therefore result in a small amount of rerouted trips, substantial increases in rerouted trips would not be expected to occur until long-range planning goals, including completion to minimum four-lane expressway facility standards, for the Principal Arterial Corridor have been achieved.

Under each of the build alternatives, emissions will likely be lower than present levels as a result of USEPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases. Further, the forecasted increase in travel speeds that would result from implementation of each of the proposed build alternatives would reduce emissions of the volatile organic compound-based mobile source air toxics (benzene, formaldehyde, acetaldehyde,

acrolein, and 1,3-butadiene) for nondiesel motor vehicles. The effect of speed changes on diesel particulate matter is unknown.

The additional travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSATs could be higher under certain build alternatives than under the No Build Alternative. However, as discussed in Appendix F, the magnitude and the duration of these potential increases compared to the No Build Alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the build alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, USEPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause regionwide MSAT levels to be significantly lower than today.

2.13.4 Avoidance, Minimization, and Mitigation Measures

2.13.4.1 Avoidance and Minimization Measures

To minimize temporary construction-related emission impacts, BMPs will be implemented, as applicable, and the Contractor will be required to comply with Caltrans Standard Specifications, which include Section 7-1.01F, "Air Pollution Control," and Section 10, "Dust Control."

Section 7-1.01F also requires the Contractor to comply with all existing rules, regulations, ordinances, and statutes of the Lake County Air Quality Management District pertaining to each construction activity.

An investigation for NOA will be completed for the Caltrans preferred alternative. If present, or if discovered during construction, remediation activities in accordance with all applicable local, state, and federal regulations will be implemented.

2.13.4.2 Mitigation Measures

No substantial impacts to air quality would result from implementation of the proposed project, and no further mitigation is required beyond the avoidance and minimization measures discussed above.

2.14 Noise

2.14.1 Regulatory Setting

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

2.14.1.1 California Environmental Quality Act

CEQA requires a strictly no-build versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless such measures are not feasible. The rest of this section will focus on the NEPA/23 CFR Part 772 noise analysis; see Chapter 3 for additional information on noise analysis under CEQA.

2.14.1.2 National Environmental Policy Act and 23 CFR 772

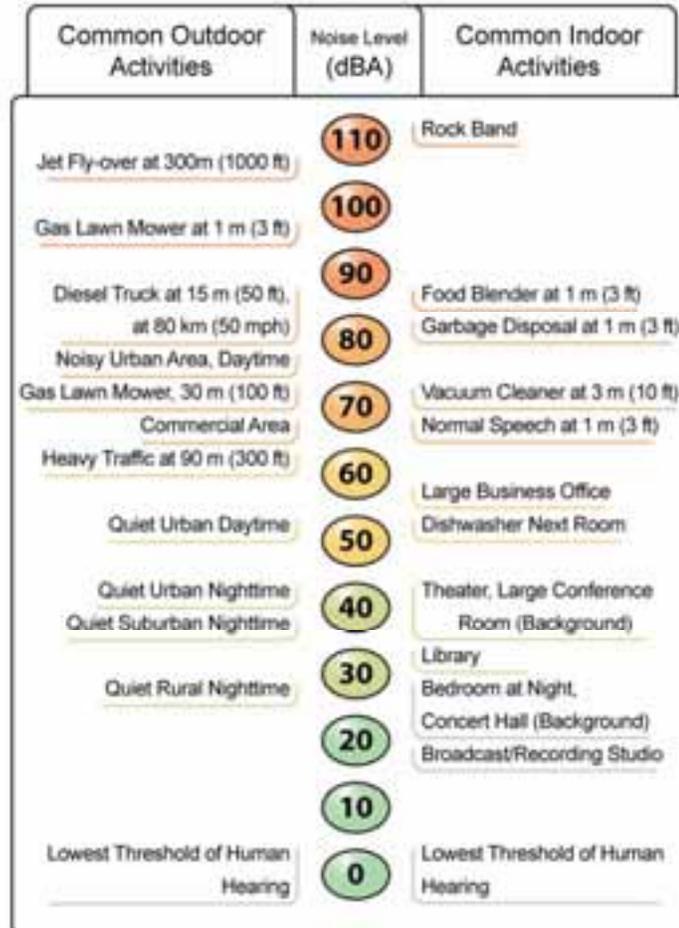
For highway transportation projects with FHWA involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR Part 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations contain noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 A-weighted decibels [dBA]) is lower than the NAC for commercial areas (72 dBA). Table 2.14-1 lists the noise abatement criteria for use in the NEPA/23 CFR Part 772 analysis.

Figure 2.14-1 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise-levels discussed in this section with common activities.

Table 2.14-1 Federal Noise Abatement Criteria

Activity Category	Noise Abatement Criteria (dBA, $L_{eq}(h)$) ²²	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	-	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Figure 2.14-1 Noise Levels of Common Activities



²² The $L_{eq}(h)$ is defined as the noisiest hour expressed as the energy-average of the A-weighted noise level occurring during a one-hour period.

In accordance with the Caltrans *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, October 1998*,²³ a noise impact occurs when the future noise level with the project results in a substantial increase in noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

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

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

2.14.2 Affected Environment

The proposed project lies along a largely undeveloped stretch of SR 29 in Lake County. Most of the land in the project area has been classified as rural by Lake County. Residential development within the project limits consists of individual single-family residences distributed along SR 29, consistent with the rural residential land use. There are no concentrations of residences adjacent to SR 29 in the project area.

The SR 29/281/Red Hills Road intersection has several small commercial uses and is the turnoff to the Konocti Harbor. Kit's Corner, a complex with a gas station, a

²³ In August 2006, a revised version of the *Caltrans Traffic Noise Analysis Protocol* was approved for use by FHWA. However, as the noise studies for this project were initiated before the publication date of the new Protocol, the decision was made to complete these studies using the requirements of the 1998 protocol.

convenience store, a motel, and several small retail spaces, is on the intersection's northwest corner.

Residences and, to a lesser degree, the commercial developments would be most susceptible to noise-related impacts.

2.14.2.1 Noise Study

To characterize existing noise levels within the project limits, long- and short-term field noise measurements were conducted at sensitive land uses that could be affected by existing and project-related noise levels. Complete details of the noise monitoring and measurement program are included in the Noise Impact Study (Illingworth and Rodkin 2003) prepared for this project as well as a more recent addendum (Illingworth and Rodkin 2007).

Residential noise receptor²⁴ locations that would be exposed to potential traffic noise impacts were identified along the project route and are shown in Figure 2.14-2. Scattered rural residences are the typical receptors identified along the proposed project alignments.

Noise measurements were conducted within the project limits on September 13–17, 2002. The noise measurement program consisted of a combination of long-term measurements (about four days in duration) and short-term measurements (10 minutes in duration). In all, four long-term noise measurements and 14 short-term noise measurements at seven locations were conducted during the noise measurement survey. Long-term noise measurements were conducted at four locations throughout the study area, documenting noise levels in 10-minute and hourly intervals. These measurements documented the trend in hourly noise levels throughout a weekend and weekday periods and the peak traffic noise hour. Short-term noise measurements were conducted simultaneously with traffic counts at seven locations throughout the study area in 10-minute intervals. Short-term measurements are used to develop calibration factors for a noise model based on actual traffic volumes and vehicle speeds during the collection of the noise samples. Noise measurement locations are used as noise modeling receivers for prediction of future traffic noise levels.

Potential noise impacts for Alternative A (no build), and Alternative C1, C2, C3, and D (four-lane expressway) peak-hour traffic noise levels were predicted using Sound32, the Caltrans version of FHWA's Traffic Noise Prediction Models (FHWA-

RD-77-108). Predicted noise levels associated with the project that approach or exceed the NAC for that activity category are considered a noise impact. For example, a predicted noise level of 66 dBA per hour or higher at an active exterior area of a residence would be considered a noise impact. In addition, noise level increases of 12 dBA or greater are considered substantial and would be considered an adverse noise impact.

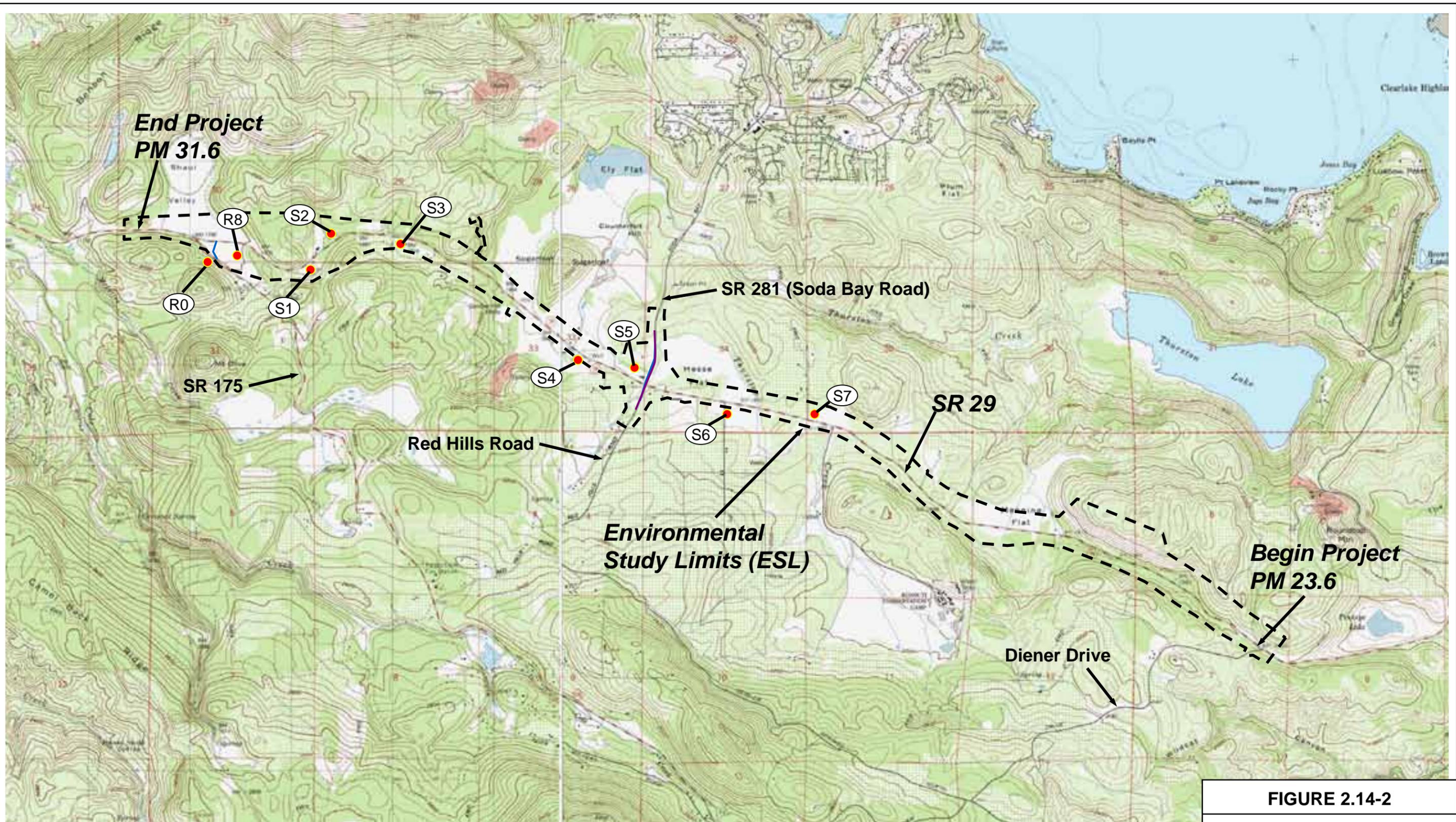
2.14.2.2 Existing Noise Conditions

Existing noise levels for the project area are shown in Table 2.14-2. Figure 2.14-3 shows the trends in hourly noise levels measured at the long-term measurement locations. Estimated peak-hour noise levels were based on daytime measurement data, peak-hour traffic data, and trends in hourly noise levels measured at representative long-term noise measurement locations. Note that long-term noise measurement locations were not representative of receptor locations. They were located at sites where uninterrupted traffic noise measurements could be made. These data were then applied to results from short-term noise measurements to estimate the highest noise hour based on noise measurement data.

Four long-term noise measurements (LT-3, LT-4, LT-6, and LT-7) and seven short-term measurements (S-1 through S-7) were conducted during the noise survey. Noise measurements at locations S-1, S-2, S-3, S-5, and S-6 were representative of the only occupied residential or lodging uses (Category B uses) where permission could be obtained. Other measurements taken at Locations S-4 and S-7 were near unoccupied residential dwellings. Measurements were also taken at a fixed distance of 100 feet from the centerline of SR 29 at each of the seven short-term measurement locations for traffic noise modeling.

Noise measurements indicated that worst-hour noise levels at representative residential receptor locations ranged from 57 to 64 dBA $L_{eq}(h)$. Figure 2.14-1 lists the noise levels of common activities to enable readers to compare them with the actual and predicted highway noise levels discussed in this section.

²⁴ Receptor locations are described by different NAC activity categories (see Table 2.14-3). For this project, receptors are considered Category B, which represents residential uses.



Source: USGS 7 1/2 minute topographic quadrangle: Kelseyville and Clearlake Highlands, CA.

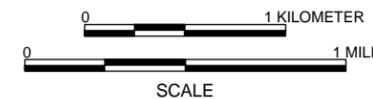


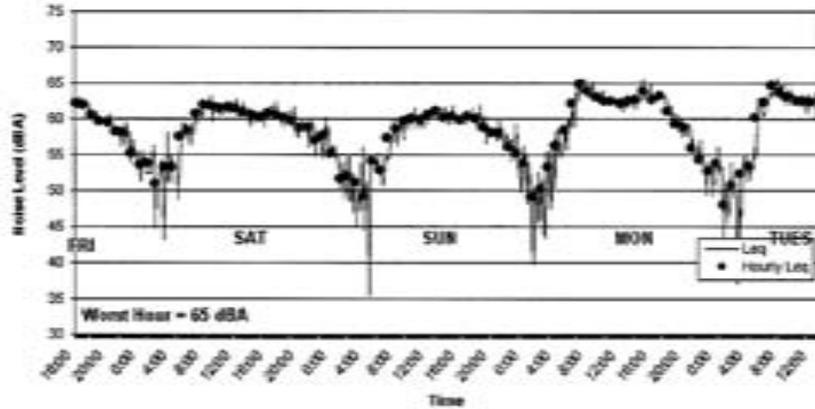
FIGURE 2.14-2

Noise Measurement Locations

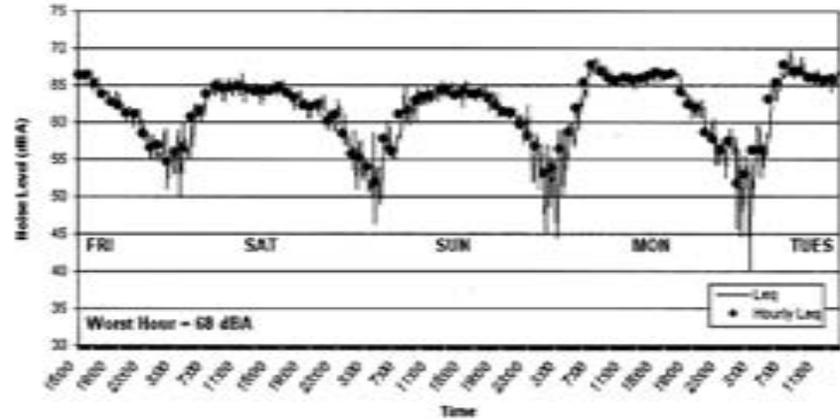
Lake 29 Improvement Project



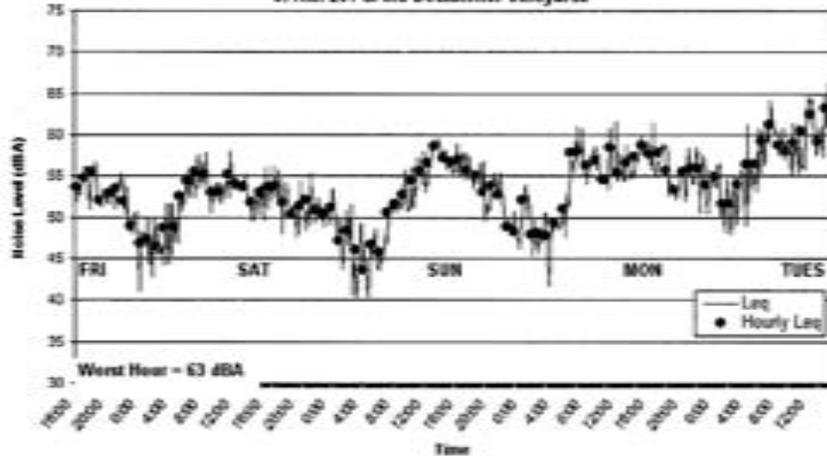
Hourly Noise Levels at Site LT-3. Approximately 46m from the Edge of Southbound Highway 29, North of Rte 281 at #7723 Hwy 29.



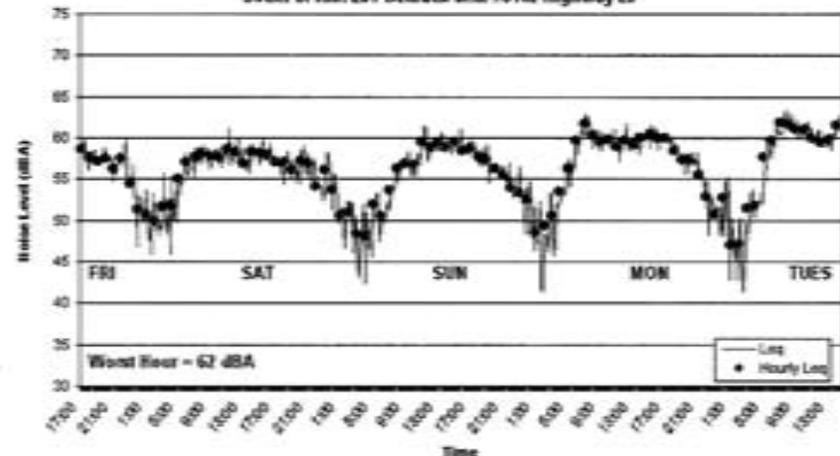
Hourly Noise Levels at Site LT-4. 25m from the Edge of Northbound Highway 29, North of Rte 281 at the S-S Ranch #7328



Hourly Noise Levels at Site LT-6. 120m from the Edge of Southbound Highway 29 South of Rte. 281 at the Beckstoffer Vineyards



Hourly Noise Levels at Site LT-7. 137m from the Edge of Southbound Highway 29 South of Rte. 281 Setback with #8140 Highway 29



26815174.00601

Lake 29 Improvement Project

Hourly Noise Levels Measured Along SR 29,
September 13-17, 2003

Figure
2.14-3

Table 2.14-2 Existing Noise Levels Along SR 29

Receptor ID	Description	Type of Development	Number of Units Represented	Activity Category and NAC (dBA)	Existing Worst Hour Noise Level (dBA)	Noise Level Measured or Modeled
R-0	Residence south of SR 175, approximately 920 feet from SR 29.	Residential	1	B / 67	54	Modeled
S-1	Near residence at 7661 SR 29. Approx. 259 feet from southbound lane.	Residential	1	B / 67	59	Measured
S-2	Residence at 7672 SR 29. Approx. 135 feet from northbound lane.	Residential	1	B / 67	64	Measured
S-3	Equivalent to residential setback. Measurement made at Bayshore Marine Service yard. Approx. 256 feet from northbound lane.	Similar to Residential	2	B / 67	58	Measured
S-4	Abandoned house on property owned by S-S Winery Ranch. Approx. 197 feet from southbound lane.	Unoccupied Residence	-	-	57	Measured
S-5	Front of Creekside Lodge at Kit's Corner. Approx. 213 feet from northbound lane.	Motel	1	B / 67	61	Measured
S-6	Beckstoffer Vineyards (unoccupied). Approx. 194 feet from southbound lane.	Unoccupied	-	-	59	Measured
R-6	Representative of receptor near Beckstoffer Vineyards. Approx. 328 feet from southbound lane.	Residence	1	B / 67	58	Modeled
S-7	Abandoned residence Approx. 98 feet from northbound lane.	Unoccupied Residence	-	-	63	Measured
R-8	Residence under construction southeast of SR 29/SR 175 intersection. Approx. 295 feet from southbound lane.	Residence	1	B / 67	58	Modeled

2.14.3 Impacts

Table 2.14-3 lists the results of noise modeling for existing levels (2001), future noise levels without the project (Alternative A; 2031), and future noise levels under each Build Alternative (2031).

Table 2.14-3 Predicted Project-Related Noise Impacts

Receptor No.	Description	Existing Noise Level, $L_{eq}(h)$ (dBA)	Predicted Noise Level (dBA), by Alternative					Activity Category and NAC (dBA)	Impact Type* (S, A/E, CR or None)
			A	C1	C2	C3	D		
R-0	Residence south of SR 175, approximately 920 feet from SR 29.	54 (modeled)	56	58	58	58	58	B / 67	None – below 66 dBA $L_{eq}(h)$
S-1	Near residence at 7661 SR 29. Approx. 259 feet from southbound lane.	59	61	63	63	64	64	B / 67	None – below 66 dBA $L_{eq}(h)$
S-2	Residence at 7672 SR 29. Approx. 135 feet from northbound lane.	64	66	63	64	63	63	B / 67	None – below 66 dBA $L_{eq}(h)$ under Build Scenarios
S-3	Equivalent to residential setback. Approx. 256 feet from northbound lane.	58	62	62	62	63	63	B / 67	None – below 66 dBA $L_{eq}(h)$
S-4	Abandoned house on property owned by S-S Winery Ranch. Approx. 197 feet from southbound lane.	57	60	62	64	66	64	--	None – inactive land use
S-5	Front of Creekside Lodge at Kit's Corner. Approx. 213 feet from northbound lane.	61	63	65	65	63	63	B / 67	None – below 66 dBA $L_{eq}(h)$
S-6	Beckstoffer Vineyards (unoccupied). Approx. 194 feet from southbound lane.	61	64	65	64	66	64	--	None – inactive land use
R-6	Representative of receptor near Beckstoffer Vineyards. Approx. 328 feet from southbound lane.	58 (modeled)	60	62	61	62	61	B / 67	None – below 66 dBA $L_{eq}(h)$
S-7	Abandoned residence. Approx. 98 feet from northbound lane.	63	65	66	66	64	68	--	None – inactive land use
R-8**	Residence under construction southeast of SR 29/SR 175 intersection. Approx. 295 feet from southbound lane.	58 (modeled)	61	--	--	--	--	B / 67	None – below 66 dBA $L_{eq}(h)$ and would be removed under Build Alternatives

* S = substantial noise level increase, A/E = approaches or exceeds the NAC, CR = classroom

** Not modeled for Build Alternatives because residence is located within the proposed roadway for these alternatives and would be removed.

2.14.3.1 Temporary and Construction Impacts **No Build Alternative**

The No Build Alternative would not modify SR 29; therefore, no noise impacts would occur.

All Build Alternatives

Construction activities associated with the proposed project would include roadway widening, new highway alignment construction, and the construction of intersections or an interchange. Highway construction activities do not typically remain in one location for long periods. Noise-sensitive receptors in a given location would not be exposed to construction noise for extended periods. Table 2.14-4 summarizes typical noise levels generated by construction equipment at a distance of 50 feet. Noise generated by construction equipment diminishes at a rate of 6 decibels per doubling of distance. With the implementation of standard Caltrans construction practices (such as requiring the Contractor to comply with all local sound control and noise level rules, regulations, and ordinances), no adverse impacts from construction noise are anticipated.

Table 2.14-4 Construction Equipment Noise

Type of Construction Equipment	Maximum Level (dBA) at 50 Feet
Scrapers	89
Bulldozers	85
Heavy trucks	88
Backhoe	80
Pneumatic tools	85
Concrete Pump	82
Impact Pile Driver	95 to 105

Source: NCHRP 1999

2.14.3.2 Permanent Impacts

No Build Alternative

The No Build Alternative would not modify SR 29; therefore, no noise impacts would occur. Under the No Build Alternative, noise levels would approach the NAC at receptor site S-2 (a residence); however, the No Build Alternative would not trigger the need to consider noise abatement.

All Build Alternatives

Traffic noise modeling indicates that noise levels without the project (Alternative A) would increase by about 2 to 4 dBA due to future increases in traffic at receptors along the existing highway alignment. Future traffic levels are predicted to be the same regardless of the alternative selected.

Project-related noise level changes at receptors would range from about -3 to +3 dBA, depending on the alternative selected. Some alternatives would move traffic away from receptors, resulting in lower noise levels; in some cases, traffic would be moved

closer to receptors, resulting in higher levels. The noise level increases would not be considered substantial, since they are less than 12 dBA.

At occupied residences (Category B receptors), future noise levels with the project are predicted to range from 58 to 65 dBA for the build alternatives (C1, C2, C3, and D; Table 2.14-3). As shown in Table 2.14-3, noise levels would not approach or exceed the NAC level of 67 dBA $L_{eq}(h)$ at residential uses that would benefit from a lowered noise level. Noise levels for Alternative D would exceed the NAC at Receptor Site S-7, but a noise impact would not result because it was determined through field visits that the subject property is unoccupied and does not have any outdoor areas of frequent human use that would benefit from a lowered noise level. Traffic noise impacts are not predicted to occur at any Category B land uses under any of the build alternatives (C1, C2, C3, and D), and thus noise abatement was not considered.

Preliminary Noise Abatement and Reasonable Cost Analysis

Since noise impacts from this project are not predicted, noise abatement is not considered. The Category B activity areas adjacent to SR 29 are predicted to experience noise levels of 65 dBA $L_{eq}(h)$ or less.

Severe Noise Impacts

Severe traffic noise impacts are considered when after-project noise levels are 75 dBA $L_{eq}(h)$ or greater. No severe noise impacts are predicted with this project.

2.14.4 Avoidance, Minimization, and Mitigation Measures

No avoidance, minimization, or mitigation measures are required.

Biological Environment

2.15 Natural Communities

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

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed in Section 2.19. Wetlands and other waters are discussed in Section 2.16.

2.15.1 Affected Environment

The project area occupies a series of small valleys (Manning Flat, Hesse Flat, and Shaul Valley) and low, intervening ridges within the rolling terrain south of Clear Lake. Elevations range from about 2,000 feet at the eastern end of the Environmental Study Limits (ESL) (Figure 1-2) to about 1,800 feet at Shaul Valley at the western end. Thurston Creek, which crosses through Hesse Flat near the center of the ESL, is the primary and the only named drainage in this area. About 24 percent of the area within the ESL is developed, disturbed, or converted to intensive agricultural uses such as vineyards and orchards. The remaining 76 percent is more or less natural, although much of the area is used for grazing.

Fifteen different plant communities were identified and mapped within the ESL. These plant communities comprise about 894 acres or 76 percent of the total area and can be divided into forest types, woodland types, chaparral types, and grassland/herbaceous types. Table 2.15-1 provides a summary of the natural community types and land uses mapped within the ESL.

Nearly a third of the plant communities (excluding other land uses) mapped within the ESL consists of oak and foothill pine woodland. Four different oak woodland types, two mixed types, and foothill pine woodland were mapped. Black oak woodland is the most common woodland type within the ESL. Smaller amounts of blue oak and valley oak woodlands are also present within the ESL.

Three chaparral types were mapped within the ESL, comprising approximately 35.4 percent of all plant communities mapped within the ESL. Northern mixed chaparral is the most common type.

About 2 percent of the plant communities within the ESL consist of knobcone pine forest. Valley oak riparian community occurs in patches along Thurston Creek and comprises about 0.5 percent of the plant communities within the ESL.

The remaining plant communities mapped within the ESL consist of nonnative grassland, vernal marsh, and freshwater marsh. Nonnative grassland is by far the most common of these herbaceous plant community types.

Table 2.15-1 Natural Communities and Land Use in the ESL

Plant Community/Land Use	Area (Acres)	% of Total Area of ESL
Natural Communities		
Black Oak Woodland	156.6	13.3%
Blue Oak Woodland	74.3	6.3%
Blue Oak Woodland/Black Oak Woodland	2.2	0.2%
Chamise Chaparral	112.5	9.6%
Foothill Pine Woodland	13.4	1.1%
Interior Live Oak Chaparral	121.0	10.3%
Interior Live Oak Woodland	21.2	1.8%
Knobcone Pine Forest	24.7	2.1%
Nonnative Grassland	139.4	11.9%
Northern Mixed Chaparral	181.6	15.5%
Valley Freshwater Marsh	4.8	0.4%
Valley Oak Riparian	5.8	0.5%
Valley Oak Woodland	3.2	0.3%
Valley Oak Woodland/Blue Oak Woodland	12.1	1.0%
Vernal Marsh	34.1	2.9%
Other Land Uses		
Agricultural	7.3	0.6%
Developed	85.4	7.3%
Disturbed/Ruderal	21.1	1.8%
Orchard	110.8	9.4%
Ornamental	1.2	.1%
Vineyard	41.8	3.6%
Total	1173.64	100.0%

Note: Acreage numbers may not equal total acreage and percentage totals may be greater or less than 100 percent due to rounding.

Due to the relatively undeveloped and open nature of the ESL, many wildlife species are likely to move through the area. Wildlife expected to occur in and around the ESL include primarily birds and mammals, but it is expected that frogs and possibly turtles use the aquatic resources in Thurston Creek.

2.15.2 Impacts

2.15.2.1 No Build Alternative

The No Build Alternative would not modify SR 29; therefore, no impacts to natural communities would occur.

2.15.2.2 All Build Alternatives

Table 2.15-2 summarizes the potential direct impacts to natural communities and land uses from each of the proposed project alternatives. The impacts include all areas within the cut and fill limits for each alternative.

Table 2.15-2 Potential Direct Impacts to Natural Communities and Land Uses with Signalized Intersection²⁵

Plant Community	Alternative (acres)			
	C1	C2	C3	D
Natural Communities				
Black Oak Woodland	33.5	29.1	36.1	48.0
Blue Oak Woodland	18.9	17.0	18.6	13.7
Blue Oak Woodland/Black Oak Woodland	0.6	0.5	0.5	0.3
Chamise Chaparral	18.0	32.9	9.2	3.4
Foothill Pine Woodland	1.2	0.6	3.0	1.2
Interior Live Oak Chaparral	23.0	22.5	22.9	24.7
Interior Live Oak Woodland	7.2	6.6	7.5	7.2
Knobcone Pine Forest	3.9	3.5	6.6	6.7
Nonnative Grassland	33.0	36.9	31.8	32.9
Northern Mixed Chaparral	42.8	45.5	40.0	38.9
Valley Freshwater Marsh	1.6	2.0	1.3	1.6
Valley Oak Riparian	1.5	1.5	1.5	1.5
Valley Oak Woodland	0.9	1.2	0.5	0.9
Valley Oak Woodland/Blue Oak Woodland	4.4	4.2	4.0	6.0
Vernal Marsh	8.0	6.3	9.0	8.5
Other Land Uses				
Agricultural	0.1	0.6	0	0.1
Developed	41.6	40.4	41.8	36.2
Disturbed/Ruderal	5.8	5.4	6.0	4.8
Orchard	18.4	14.9	19.3	15.8
Ornamental	0.3	0.3	0.2	0.5
Vineyard	6.4	6.7	6.3	10.7
Total	271.0	278.5	266.1	263.5

Note: Acreage numbers may not equal total acreage due to rounding.

Construction of this project would result in impacts to approximately 263 to 278 acres of natural communities and land uses overall, depending upon the alternative

²⁵ See Appendix B for a complete table of impacts to all biological resources resulting from the build alternatives with the various interchange options.

selected. The natural communities that would experience the most impacts from the build alternatives are northern mixed chaparral, nonnative grassland, and black oak woodland. Each of the build alternatives would also have an impact on close to 40 acres of developed land.

Oak Woodlands

The California Senate passed a resolution effective September 1, 1990, protecting heritage oak stands. Senate Concurrent Resolution No. 17 states that state agencies shall “assess and determine the effects of their land use decisions or actions within any oak woodland.” Oak woodland is defined as “a five-acre circular area containing five or more trees per acre of blue, Englemann, valley or coast live oak,” and the resolution requests that state agencies “preserve and protect native oak woodlands to the maximum extent feasible...or provide for replacement plantings.”

As shown in Table 2.15-3, each of the build alternatives would impact approximately 20 to 25 acres of oak woodland species protected by Senate Concurrent Resolution No. 17. Impacts for each of the interchange options are within this same range.

Table 2.15-3 Potential Impacts to Oak Woodlands with Signalized Intersection

Oak Woodland Type	Alternative (acres)			
	C1	C2	C3	D
Blue Oak Woodland	18.9	17.0	18.6	13.7
Blue Oak Woodland/Black Oak Woodland	0.6	0.5	0.5	0.3
Valley Oak Woodland	0.9	1.2	0.5	0.9
Valley Oak Woodland/Blue Oak Woodland	4.4	4.2	4.0	6.0
Total	24.7	22.8	23.6	20.9

Note: Acreage numbers may not equal total acreage due to rounding.

Valley Oak Riparian

Riparian forests are forested areas subject to frequent inundation that occur adjacent to a body of water such as a river, stream, pond, lake, or marshland. Valley oak riparian forests have the most complex structure of any vegetation type in California. As a result, they are among the most diverse in terms of the animal life that they support (Pavlik et al. 2000). Each of the build alternatives will have a direct impact on approximately 1.5 acres of valley oak riparian habitat.

Wildlife

Tree and vegetation removal may result in a direct and permanent loss of habitat valuable to wildlife.

Habitat fragmentation is not expected to occur on a large scale because the build alternatives largely parallel the existing roadway and, in many areas, would replace the existing roadway. In some instances where the existing roadway will serve as frontage and/or access roads, more fragmentation can be expected to occur. Unused sections of the existing roadway will be obliterated (as deemed appropriate) and revegetated. Project construction activities could temporarily restrict terrestrial wildlife movement through the project study area. In addition, construction noise could temporarily alter foraging patterns of resident wildlife species. Long-term impediments to wildlife movement within the project study area are not anticipated to exceed existing conditions, however, because roadways already traverse the project corridor throughout the study area. The project is not expected to have substantial impacts to wildlife corridors because no median barrier will be installed. The installation of box culverts at four to eight locations (depending upon the alternative selected) will allow access by both aquatic and terrestrial fauna to cross under the roadway.

2.15.3 Avoidance, Minimization, and Mitigation Measures

2.15.3.1 Avoidance and Minimization Measures

- Tree and vegetation removal will be limited to only that required to construct the project.
- All native oak trees that are to remain within and adjacent to the proposed project will be designated as Environmentally Sensitive Areas (ESAs) and will be temporarily fenced with orange plastic construction (exclusion) fencing throughout all grading and construction activities. The exclusion fencing will be installed 6 feet outside of the dripline of each specimen tree, and will be staked a minimum of every 6 feet. The fencing is intended to prevent equipment operations in the proximity of protected trees from compacting soil, crushing roots, or colliding with tree trunks or overhanging branches.
- Mitigation measures specified for visual/aesthetic impacts, including the preparation of a Revegetation and Restoration Plan (see Section 2.7.4.2), will provide compensation for impacts to trees and vegetation, including oak woodlands. Tree and plant species selected for revegetation will be native species appropriate for the project area and will not include any noxious or invasive

weeds. To the extent possible, species used for replanting will consist of the same species removed by the project.

2.15.3.2 Mitigation Measures

Mitigation will be required for impacts to riparian habitat under the jurisdiction of CDFG, including valley oak riparian habitat. The majority of the riparian habitat affected by the project (as shown in Table 2.15-4) is also under the jurisdiction of USACE (see Section 2.16). A Habitat Mitigation and Monitoring Plan will be prepared that will include specific mitigation measures for impacts to remaining areas of riparian habitat. The plan will include compensation requirements for unavoidable impacts to riparian habitat, based on the selected alternative. The plan will provide specific mitigation details, including approved mitigation sites, plan implementation design and construction, and a minimum five-year monitoring plan. Mitigation measures will be developed in coordination with the resource agencies and will include all necessary measures to offset project effects. Mitigation for the loss of riparian habitat may include purchase of lands within the project area or at off-site locations that are approved by the resource agencies and that will provide opportunities to enhance and create riparian habitat.

Table 2.15-4 Potential Permanent Direct Impacts to CDFG Riparian/Waters with Signalized Intersection

CDFG Riparian/Waters	Alternative (acres)			
	C1	C2	C3	D
Total CDFG Riparian/Waters	1.42	1.51	1.42	1.36

Note: Direct impacts refer to all CDFG riparian/waters within the cut and fill limits of the project. Areas outside of the cut and fill lines are not included in these calculations.

2.16 Wetlands and Other Waters

2.16.1 Regulatory Setting

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

for the purposes of the Clean Water Act, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the Clean Water Act.

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

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

At the state level, wetlands and waters are regulated primarily by CDFG and the RWQCBs. In certain circumstances, the California Coastal Commission (or Bay Conservation and Development Commission) may also be involved. California Fish and Game Code Section 1600 et seq. requires that any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed, channel, or bank of a river, stream, or lake must first notify CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFG jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from CDFG.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCBs also issue water quality certifications in compliance with Section 401 of the Clean Water Act. (See Section 2.10 for additional details).

2.16.2 Affected Environment

A delineation of wetlands and other waters potentially subject to regulation by USACE and/or CDFG was conducted between July 2002 and May 2003. In November 2003, an initial wetland delineation report and jurisdictional determination request was submitted to USACE for verification. In August 2004, a revised wetland delineation report and jurisdictional determination request was submitted to USACE, which was followed by a revision to Table E of the wetland delineation report on March 22, 2005. On March 28, 2005, USACE provided concurrence with and verification of Caltrans' estimate of waters of the U.S. (Appendix G).

After the wetland verification was received from USACE in March 2005, additional areas of potential wetlands and other waters of the U.S. were identified within the ESL. The majority of these areas are outside of the cut and fill limits of the project. Within the cut and fill limits of the project, new wetland areas have been included in the assessment of potential direct impacts to wetlands and other waters of the U.S., although they have not been verified. Additional wetland delineations were conducted in the spring of 2007, and an additional jurisdictional determination request will be submitted to USACE in the summer of 2007.

The ESL lies within three closed drainage basins separated by low ridges. The primary (about 75 percent) drainage basin within the ESL lies within the Thurston Creek drainage basin. Thurston Creek originates in the mountains just to the south of the project area. The intermittent creek meanders extensively in a generally south-to-north direction through the project area before turning toward the east and terminating at Thurston Lake.

The secondary drainage basin within the ESL lies within a closed drainage basin consisting of Shaul Valley and the surrounding hills. Intermittent and ephemeral flows in this basin are collected by a small, unnamed drainage that flows north and eventually dissipates throughout the floor of the valley.

The third drainage basin, which is also a closed drainage basin, is Pinkeye Lake. This closed drainage basin is separated from the Thurston Lake drainage basin by Roundtop Mountain (elevation 2,284 feet). Water flowing from impervious surfaces east of Diener Drive within the ESL flows into this closed drainage basin, and represents about 1 percent of the water flows within the ESL.

A number of mapped springs and seeps occur in the area. Many of the potential wetland areas within the ESL are groundwater driven and are associated with these springs and seeps.

Wetland types identified in the ESL include freshwater marsh, irrigated pasture, riparian scrub, ruderal wetland, vernal marsh, and vernal pool. Vernal marsh occurs in several areas within the ESL including along Thurston Creek at Konocti Conservation Camp Road and in Hesse Flat and Manning Flat. Freshwater marsh was also mapped in the ESL near the intersection of SR 29 and Red Hills Road, and along Thurston Creek at Hesse Flat and at Red Hills Road. Riparian scrub occurs along Thurston Creek at Konocti Conservation Camp Road and at Red Hills Road. Vernal pools are present north of SR 29 near the intersection with Konocti Conservation Camp Road. Table 2.16-1 summarizes the acreages of wetlands and other waters of the United States in the ESL.

Table 2.16-1 Wetlands and Other Waters in the ESL

Type	Total (Acres)
Freshwater Marsh	16.83
Irrigated Pasture	8.64
Riparian Scrub	1.54
Ruderal Wetland	16.59
Vernal Marsh	14.47
Northern Volcanic Ash Vernal Pool	.92
Nonwetland Waters	1.94
Total Wetlands and Waters	60.93
CDFG Riparian/Waters	5.15

Note: This table includes all wetlands and waters mapped within the ESL, regardless of the Section 404 jurisdiction. Of the 60.93 acres of wetlands and other waters currently mapped within the ESL, 31.86 acres have been verified as jurisdictional under Section 404, and another 15.82 acres have been verified as nonjurisdictional. The remaining 13.32 acres of wetlands were delineated after the original USACE verification was received. A second jurisdictional determination request will be submitted for these areas. Additionally, the majority of the CDFG riparian/waters have also been mapped as other wetland types and will be considered jurisdictional under Section 404.

The CDFG regulates wetland areas only to the extent that those wetlands are part of a river, stream, or lake as defined by CDFG. Thurston Creek and the wetlands and riparian habitat directly associated with the creek are under CDFG jurisdiction and will require a Streambed Alteration Agreement from CDFG. Riparian habitat includes willows, alders, and other vegetation typically associated with the banks of a stream or lake shoreline. In most situations, wetlands associated with a stream or lake would fall within the limits of riparian habitat. Vernal pools and marsh habitats that are not

associated with Thurston Creek and that do not fall within CDFG's definition of a river, stream, or lake are not within CDFG jurisdiction.

Freshwater Marsh

Freshwater marsh is more or less permanently flooded, although surface water may be absent from late summer through fall. This community typically supports a relatively limited diversity of plant species and may be essentially monotypic. Common freshwater marsh species in the ESL include cattail, hardstem bulrush, rushes, and occasional arroyo willows.

Freshwater marsh occurs within the ESL at Hesse Flat and at the human-made pond west of the SR 29/281/Red Hills Road intersection.

Irrigated Pasture

A large irrigated pasture occurs north of SR 29 and west of Red Hills/Soda Bay Road. Typical plant species include sedges, rushes, Mediterranean barley, and dock.

Riparian Scrub

Riparian scrub, a component of valley oak riparian forest, is not common within the ESL and occurs mainly in small patches along Thurston Creek. Typical species include arroyo willow, interior live oak (*Quercus wislizenii*), mugwort, and several species of rush. A variety of ruderal understory species also occur in this wetland type.

Ruderal Wetland

Ruderal wetland is not a plant community per se but rather a type of wetland that is populated with ruderal plants, or plants that colonize disturbed areas. Ruderal wetland plants occur in disturbed areas that have wetland hydrology, such as along streams, irrigation canals, and drainage ditches, and in pastures and irrigated cropland. Areas classified as ruderal wetland occupy a large portion of Shaul Valley near the western end of the project. Ruderal wetland is seasonally saturated by groundwater but generally not inundated. An assemblage of both native and nonnative ruderal hydrophytes characterizes this community. Typical species include teasel (*Dipsacus fullonum*), dock (*Rumex crispus*), Himalaya blackberry (*Rubus discolor*), Caley pea (*Lathrus hirsutus*), clover (*Trifolium willdenovii*), loosestrife (*Lythrum hyssopifolium*), velvet grass (*Holcus lanatus*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), soft chess (*Bromus hordeaceus*), rushes (*Juncus* spp.), spike rush (*Eleocharis macrostachya*), and sedges (*Carex* sp.) Springs and seeps in this area appear to sustain these wetlands.

Vernal Marsh

Vernal marsh is similar to ruderal wetland but is generally less disturbed and supports a greater percentage of native plant species. Although vernal marsh may be seasonally inundated, water depth is generally shallow, and the period of inundation is relatively short. These seasonally wet areas are often transitional between permanently (or nearly permanently) flooded freshwater marsh and upland habitats. Many plant species are annuals. Typical plant species that occur in vernal marsh areas include popcorn flower (*Plagiobothrys* spp.), coyote thistle (*Eryngium alismaefolium*), goldfields (*Lasthenia* spp.), navarretia (*Navarretia* sp.), blow wives (*Achyrachaena mollis*), mesa mint (*Pogogyne* sp.), hairgrass (*Deschampsia* sp.), Mediterranean barley, spikerush, rushes, sedges, nutsedge (*Cyperus* spp.), teasel, and mugwort (*Artemisia douglasiana*). Occasional arroyo willow (*Salix lasiolepis*), hardstem bulrush (*Scirpus acutus*), and patches of cattail (*Typha* sp.) also occur.

Northern Volcanic Ash Flow Vernal Pool

Vernal pools are small basins that collect rainfall and surface runoff from a surrounding grassland watershed. The presence of an impervious layer of subsoil prevents water from infiltrating down into the soil profile, which causes water to remain in depressions for longer periods of time. The frequency and duration of ponding and saturation vary among vernal pools, depending on the size of the basin and its watershed, depth to the impervious subsoil layer, and patterns and amounts of rainfall.

The ESL and surrounding area are located in the Lake-Napa Vernal Pool Region (CDFG 1998), which is located in the inner Coast Ranges north of San Francisco Bay and south of Clear Lake. Vernal pool types in this region include Northern Volcanic Ash Flow, Northern Basalt Flow, and unclassified Northern Vernal Pool types.

Several shallow Northern Volcanic Ash Flow vernal pools were identified within the ESL north of the intersection of SR 29 and Konocti Conservation Camp Road. These pools are located within the nonnative grassland plant community and are not mapped as separate plant communities. During the winter rainy season, an assemblage of primarily annual plant species appears; many of these species are endemic to vernal pools. Vernal pool vegetation within the ESL includes coyote thistle, popcorn flower, slender hairgrass (*Deschampsia elongata*), smooth goldfields (*Lasthenia glaberrima*), Burke's goldfields (*Lasthenia burkei*), and needle-leaved navarretia (*Navarretia intertexta* var. *intertexta*).

Other Waters of the United States

Other jurisdictional waters of the United States include rocky, unvegetated intermittent and perennial creek channels. These areas do not qualify as wetlands because they often lack hydrophytic vegetation or hydric soil conditions. However, “other waters” are subject to USACE jurisdiction. Other waters of the U.S. are considered sensitive natural communities because they provide habitat for aquatic wildlife, supply drinking water for terrestrial wildlife, and influence the quality of wildlife and fishery habitat in downstream reaches.

Other waters of the U.S. are limited to small ephemeral streams at the east end of the ESL and in Manning Flat, and along unvegetated segments of Thurston Creek.

2.16.3 Impacts

2.16.3.1 No Build Alternative

The No Build Alternative would not modify SR 29; therefore, no wetland impacts would occur.

2.16.3.2 All Build Alternatives

Total Direct Impacts to Wetlands and Other Waters of the U.S.

Table 2.16-2 lists the potential direct impacts to Section 404²⁶ wetlands and other waters of the U.S. for each of the proposed build alternatives with a signalized intersection at SR 29/281/Red Hills Road.

Table 2.16-2 Potential Direct Impacts to Wetlands and Other Waters of the U.S. in the ESL with Signalized Intersection

Wetland or Other Waters Type	Alternative (acres)			
	C1	C2	C3	D
Freshwater Marsh	3.03	3.05	3.08	3.87
Irrigated Pasture	0.19	0.70	0.00	0.16
Riparian Scrub	1.21	1.21	1.21	1.22
Ruderal Wetland	0.03	0.06	0.02	0.06
Vernal Marsh	2.45	1.92	2.92	1.67
Vernal Pool	0.00	0.00	0.00	0.00
Total Impacts to Section 404 Wetlands	6.90	6.94	7.23	6.97
Other Waters (creeks/channels)	0.90	0.66	1.14	0.92
Total Impacts to Section 404 Wetlands and Other Waters of the U.S.	7.80	7.60	8.37	7.89

Note: Direct impacts refer to all wetlands and other waters of the U.S. within the cut and fill limits of the project. Areas outside of the cut and fill lines are not included in these calculations. Potential indirect effects are discussed below.

²⁶ For the purposes of determining impacts, the 13.32 acres of wetlands and waters that have not yet been verified as jurisdictional under Section 404 were assumed to be jurisdictional. Only the verified non-jurisdictional wetlands and waters were not included in impact calculations.

Table 2.16-3 shows the impacts of the build alternatives with the various interchange options. Construction of the project would result in the permanent loss of 7.60 to 10.83 acres of wetlands and other waters of the U.S. Permanent direct impacts to wetlands and other waters of the U.S. are expected to occur as a result of cutting slopes, placing fill, grading activities, extending and replacing culverts, and realigning drainages.

Changes to the alignment of Alternative D to avoid endangered plant species have resulted in an additional 1.15 acres of direct impacts to wetlands and other waters of the U.S. for this alternative. These revisions are discussed in detail in Section 4.6.

Construction activities may also result in temporary direct impacts to wetlands. Construction equipment may result in areas of temporary disturbance.

Indirect impacts are effects caused by construction activities that occur later in time. These impacts may include: alteration of hydrology; erosion; human intrusion; increased sedimentation; and introduction of pesticides, predators, and weedy nonnative vegetation.

Indirect impacts to jurisdictional stream courses throughout the project area are possible if roadway widening and realignment results in alteration of the hydrology of jurisdictional resources within the ESL. Drainage improvements are proposed throughout the project area to lengthen culverts to accommodate highway widening and realignment and to improve the efficiency and safety of the highway drainage system. Some reconfiguration of existing stream channels and drainageways will be required, including widening of the Thurston Creek channel near the SR 29/281/Red Hills Road intersection. Changes made to Alternative D to avoid endangered plants will require the realignment of a portion of Thurston Creek near Konocti Conservation Camp Road. Alternatives C1, C2, and C3 would not require realignment of Thurston Creek at this location.

Indirect impacts to jurisdictional areas throughout the project area are also possible due to the introduction of weedy plant species from construction equipment or the spread of known noxious weeds within the project area. Caltrans will implement design features that will limit the introduction or spread of noxious weeds, as outlined in Section 2.20.4.

Table 2.16-3 Potential Direct Impacts to Wetlands in the ESL with Interchange Options

	Spread Diamond Option 1				Spread Diamond Option 2				Partial Cloverleaf with Roundabouts Option 1				Partial Cloverleaf with Roundabouts Option 2			
	C1	C2	C3	D	C1	C2	C3	D	C1	C2	C3	D	C1	C2	C3	D
Freshwater Marsh	4.53	4.77	4.25	5.26	4.54	4.87	4.18	4.47	5.28	5.36	5.28	6.02	5.17	5.70	5.38	5.21
Irrigated Pasture	0.11	0.46	0.00	0.15	0.11	0.48	0.00	0.15	0.12	0.53	0.00	0.15	0.13	0.61	0.00	0.15
Riparian Scrub	1.21	1.24	1.18	1.21	1.20	1.23	1.18	1.20	1.38	1.43	1.32	1.38	1.38	1.43	1.31	1.38
Ruderal Wetland	0.03	0.06	0.02	0.06	0.03	0.06	0.02	0.06	0.03	0.06	0.02	0.06	0.03	0.06	0.02	0.06
Vernal Marsh	2.45	1.92	2.92	1.67	2.45	1.92	2.92	1.23	2.45	1.92	2.92	1.67	2.50	1.92	2.92	1.23
Vernal Pool	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Impacts to Section 404 Wetlands	8.32	8.44	8.37	8.35	8.33	8.56	8.30	7.12	9.26	9.31	9.54	9.28	9.21	9.73	9.63	8.03
Other Waters (creeks/channels)	0.99	0.75	1.23	0.96	0.99	0.75	1.24	0.95	0.96	0.71	1.20	0.96	0.94	0.71	1.20	0.95
Total Impacts to Section 404 Wetlands and Other Waters	9.31	9.19	9.60	9.31	9.32	9.31	9.53	8.07	10.22	10.02	10.74	10.23	10.15	10.44	10.83	8.99

2.16.4 Avoidance, Minimization, and Mitigation Measures

2.16.4.1 Avoidance and Minimization Measures

No avoidance or minimization measures are required.

2.16.4.2 Mitigation Measures

- Project construction activities within aquatic features will not take place until there is a low-flow condition.
- All waters and wetlands adjacent to the construction zone that will not be filled as a result of the project will be designated as ESAs, and shall be fenced and signed to prevent inadvertent damage to these resources. Best Management Practices will be followed to minimize erosion and reduce sediments from entering channels and wetlands. All disturbed areas will be replanted upon completion of construction to stabilize soils.
- The proposed project will require a Clean Water Act Section 404 permit from USACE and a Section 401 Water Quality Certification from the California RWQCB. A Streambed Alteration Agreement will also be required from CDFG for work in Thurston Creek. Conditions of these permits will include timing restrictions (work during low-flow periods, typically from June 15 to October 1) to avoid water quality and species related impacts, and the restoration of native riparian vegetation affected by project construction.
- A Habitat Mitigation and Monitoring Plan will be prepared that will include specific mitigation measures for impacts to wetlands and other waters of the U.S. The plan will include compensation requirements for unavoidable impacts to wetlands and other waters of the U.S., based on the selected alternative. The plan will provide specific mitigation details, including approved mitigation sites, plan implementation design and construction, and a minimum five-year monitoring plan. Mitigation measures will be developed in coordination with the resource agencies and will include all necessary measures to offset project effects. The goal of the mitigation plan is to achieve no net loss of wetland habitat functions and values. Compensation wetlands will be designed to equal or exceed the values of wetlands affected by the project. Mitigation for the loss of wetlands and other waters of the U.S. may include purchase of lands within the project area, or at off-site locations that are approved by the resource agencies and that will provide opportunities to enhance and create wetland features and stream channels.

Mitigation for impacts to riparian habitat not under the jurisdiction of USACE is discussed in Section 2.15.3.2.

2.17 Plant Species

2.17.1 Regulatory Setting

The USFWS and CDFG share regulatory responsibility for the protection of special-status plant species. Special-status species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Section 2.19 provides detailed information regarding these species.

This section discusses all other special-status plant species, including CDFG fully protected species and species of special concern, USFWS candidate species, and nonlisted California Native Plant Society (CNPS) rare and endangered plants. Many at-risk plants discussed in this section were formerly designated as federal Species of Concern (FSC) or federal Species of Local Concern (FSLC). Species of Concern is an informal term not identified in FESA. The Sacramento USFWS no longer maintains a Species of Concern list. These designations have been retained for the purposes of identifying at-risk species in this environmental document, but these species have no statutory protection under FESA.

The regulatory requirements for FESA can be found at 16 USC Section 1531 et seq. (see also 50 CFR Part 402). The regulatory requirements for CESA are set forth in California Fish and Game Code Section 2050 et seq. The proposed project is also subject to the Native Plant Protection Act (California Fish and Game Code Sections 1900–1913) and CEQA (PRC Sections 21000–21177).

2.17.2 Affected Environment

The special-status plant species listed in Table 2.17-1 are those known to occur in (or were detected very near) the ESL. A discussion of each of these species follows Table 2.17-1. A complete list of regional species and habitats of concern is included in Appendix H. Threatened and endangered species are listed in Table 2.19-1.

Table 2.17-1 Special-Status Plant Species Potentially Occurring Within the ESL

Scientific Name	Common Name	Status ¹	Habitat Requirements	Habitat in ESL?	Species in ESL?	Rationale
<i>Arctostaphylos manzanita</i> ssp. <i>elegans</i>	Konocti manzanita	CNPS 1B	Chaparral, cismontane woodland, and lower montane coniferous forest, often on volcanic soils from 1,295 to 5,300 feet.	Yes	Yes	Species observed in several locations throughout the ESL.
<i>Calyptridium quadripetalum</i>	Four-petaled pussypaws	CNPS 4	Chaparral, lower montane coniferous forest, usually on sandy or gravelly serpentine soils (1,030 to 6,690 feet).	Yes	Yes	Two populations of this species were identified in the ESL.
<i>Horkelia bolanderi</i>	Bolander's horkelia	FSC, CNPS 1B	Meadows and edges of vernal wet places in lower montane coniferous forest, chaparral, and valley and foothill grasslands (1,475 to 3,610 feet).	Yes	Yes	One population of this species was identified within the ESL.
<i>Limnanthes floccose</i> ssp.	Woolly meadowfoam	CNPS 4	This species occurs in moist meadows and vernal pools in chaparral, cismontane woodland, and valley and foothill grassland.	Yes	Yes	This species was identified in Manning Flat and in Shaul Valley within the ESL.
<i>Linanthus acicularis</i>	Bristly linanthus	CNPS 4	This species is an annual herb species that grows in chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland.	Yes	Yes	This species was found in the project area, west of Manning Flat. None of the alternatives will impact this species.
<i>Antirrhinum virga</i>	Tall snapdragon	CNPS 4	This species is a perennial herb species that grows in lower montane coniferous forest habitats.	Yes	Yes	Two populations of this species were identified in the ESL.
<i>Micropus amphibolous</i>	Mt. Diablo cottonweed	CNPS 3	This species is an annual herb that occurs in rocky soils in broadleaf upland forest, chaparral, cismontane woodland, and valley and foothill grassland.	Yes	Yes	One population of this species was identified in the ESL. None of the alternatives will impact this species.
<i>Viburnum ellipticum</i>	Oval-leaved viburnum	CNPS 2	This species is a deciduous shrub that occurs in chaparral, cismontane woodland, and lower montane coniferous forest habitats.	Yes	Yes	One individual of this species was identified near the eastern edge of the project south of SR 29.
<i>Zigadenus micranthus</i> var. <i>fontanus</i>	Marsh zigadenus	CNPS 4	Chaparral, cismontane woodland, lower montane coniferous forest, meadows, seeps, marshes and swamps, often on serpentine soils (50 to 3,280 feet).	Yes	Yes	One population of this species was observed in the ESL.
<i>Piperia Michaelii</i>	Michael's Piperia	CNPS 4	Coastal bluff scrub, Closed-cone coniferous forest, Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest	Yes	Yes	One small population was discovered within the ESL west of Konocti Camp Road on the North side of SR 29.

¹ CNPS 1B = Rare or Endangered in California and elsewhere; CNPS 2 = Rare or Endangered in California, more common elsewhere; CNPS 3 = Plants about which more information is needed; CNPS 4 = Plants of limited distribution; FSC = Federal Species of Concern

2.17.3 Impacts

2.17.3.1 No Build Alternative

The No Build Alternative would not modify SR 29; therefore, no impacts to special-status plant species would occur.

2.17.3.2 All Build Alternatives

The special-status plant species with the potential to occur in the ESL (Table 2.17-1) were further evaluated to identify potential impacts from the proposed project. Table 2.17-2 lists the species that were determined to have a reasonable likelihood of occurring in the ESL and being affected by the project alternatives.

Table 2.17-2 Potential Impacts to Special-Status Plant Species in the ESL with Signalized Intersection

Plant Species	Alternatives (Acres)			
	C1	C2	C3	D
Konocti manzanita and Bolander's horkelia ²⁷	0.286	0.486	0.072	0.010
Four-petaled pussypaws	0	0	0	0.003
Konocti manzanita	48.312	63.353	41.173	25.328
Marsh zigadenus	0	0	0	0
Woolly meadowfoam	7.600	7.996	6.948	8.212
Michael's piperia	0	0	0	0.003
Oval-leaved viburnum	0.002	0	0.002	0.002
Mount Diablo cottonweed	0	0	0	0
Bristly linanthus	0	0	0	0
Tall snapdragon	0	0	0	0
TOTALS	56.200	71.835	48.195	33.558

Bolander's Horkelia

Bolander's horkelia (*Horkelia bolanderi*) is a federal species of concern and a CNPS List 1B species. This species grows in meadows and edges of vernal wet places in lower montane coniferous forest, chaparral, and valley and foothill grasslands.

One population of this species was identified within the ESL. This population was estimated to include 500 to 1,000 individuals and is located north of the intersection of SR 29 and Konocti Conservation Camp Road.

²⁷ In one area, these two species were mapped together. For mitigation purposes, this area will be counted as Bolander's horkelia.

Alternatives C1, C2, and C3 would have impacts on between 0.072 and 0.486 acres of Borland's horkelia. Alternative D would have the smallest impact, at 0.010 acre.

Four-Petaled Pussypaws

Four-petaled pussypaws (*Calyptridium quadripetalum*) is an annual herb species that grows in chaparral and lower montane coniferous forest. It is a CNPS List 4 species but has no federal or state status.

Two populations of four-petaled pussypaws were identified in the ESL. One population is south of SR 29 at the east end of the ESL and consists of several hundred plants growing on and near a dirt road. The other population is south of SR 29 in Manning Flat and is composed of 200 to 300 plants.

Alternatives C1, C2, and C3 would not affect this species. Alternative D would affect 0.003 acre of this species.

Konocti Manzanita

Konocti manzanita (*Arctostaphylos manzanita* ssp. *elegans*) is a CNPS List 1B species but has no federal or state status. Konocti manzanita is a shrub species that occurs in chaparral, cismontane woodland, and lower montane coniferous forest, often on volcanic soils.

Konocti manzanita was identified throughout the ESL but was more abundant toward the eastern end. Some areas were too dense to survey. These areas were assessed for potential habitat for Konocti manzanita.

The build alternatives would have an impact on between approximately 25.328 acres (with Alternative D) and 63.353 acres (with Alternative C2) of Konocti manzanita.

Marsh Zigadenus

Marsh zigadenus (*Zigadenus micranthus* var. *fontanus*) is a CNPS list 4 species but has no federal or state status. This species grows in chaparral, cismontane woodland, lower montane coniferous forest, meadows, seeps, marshes, and swamps and is often found on serpentine soils.

One population of this species was identified in the ESL. This population is located on the south side of Manning Flat south of SR 29.

None of the build alternatives is expected to affect this species.

Woolly Meadowfoam

Woolly meadowfoam (*Limnanthes floccosa* ssp. *floccosa*) is a CNPS List 4 species but has no federal or state status. This species occurs in moist meadows and vernal pools in chaparral, cismontane woodland, and valley and foothill grassland.

Woolly meadowfoam was identified in Manning Flat and in Shaul Valley within the ESL.

Impacts to woolly meadowfoam from the proposed build alternatives would range from 7.600 to 8.212 acres. The populations that would be affected are located in Manning Flat and Shaul Valley, and range from a few hundred to several thousands of individuals.

Michael's Piperia or Michael's Rein Orchid

Michael's piperia is a CNPS List 4 species but has no federal or state status. This species occurs in coastal scrub and coastal bluff scrub, closed-cone coniferous forest and lower montane coniferous forest, cismontane woodland, and chaparral habitats.

Alternatives C1, C2, and C3 would not affect this species. Alternative D would have an impact on 0.003 acre of Michael's piperia.

Oval-Leaved Viburnum

Oval-leaved viburnum (*Viburnum ellipticum*) is a CNPS List 2 species but has no federal or state status. This deciduous shrub occurs in chaparral, cismontane woodland, and lower montane coniferous forest habitats.

Alternatives C1, C3, and D would each have an impact on 0.002 acre of oval-leaved viburnum. Alternative C2 would not affect this species.

Mount Diablo Cottonweed

Mount Diablo cottonweed is a CNPS List 3 species but has no federal or state status. This annual herb occurs in broadleaved upland forest, chaparral, cismontane woodland, and valley and foothill grassland habitats.

None of the project alternatives would affect this species.

Bristly Linanthus

Bristly linanthus is a CNPS List 4 species but has no federal or state status. This annual herb occurs in chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland habitats.

None of the project alternatives would affect this species.

Tall Snapdragon

Tall snapdragon (*Antirrhinum virga*) is a CNPS List 4 species but has no federal or state status. This perennial herb occurs in lower montane coniferous forest habitats.

None of the project alternatives would affect this species.

2.17.4 Avoidance, Minimization, and Mitigation Measures

2.17.4.1 Avoidance and Minimization Measures

- Tree and vegetation removal will be limited to that required to construct the project.
- Special-status plant species that are to remain within and adjacent to the proposed project will be designated as ESAs and will be temporarily fenced with orange plastic construction (exclusion) fencing throughout all grading and construction activities. The fencing is intended to prevent encroachment by construction vehicles and personnel. The exact location of the fencing will be determined by a qualified biologist.

2.17.4.2 Mitigation Measures

Mitigation measures for impacts to special-status plants will be determined in consultation with USFWS and CDFG and will be based on the identification of the affected species. Mitigation measures will be specified in the project's Habitat Mitigation and Monitoring Plan and may include seed and plant tissue collection from special-status plants to include in the revegetation of disturbed or affected areas. Caltrans may also contribute funds to a specialized bank or conservation fund account to mitigate (offset) impacts to special-status plant species.

2.18 Animal Species

2.18.1 Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The USFWS, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries), and CDFG are responsible for implementing these laws. This section discusses wildlife not listed or proposed for listing under the state or federal Endangered Species Acts. Special-status species addressed in this section include CDFG fully protected species and species of special concern, and USFWS or NOAA

Fisheries candidate species. Many at-risk animal species discussed in this section were formerly designated as federal Species of Concern (FSC) or federal Species of Local Concern (FSLC). Species of Concern is an informal term not identified in FESA. The Sacramento USFWS no longer maintains a Species of Concern list. These designations have been retained for the purposes of identifying at-risk species in this environmental document, but these species have no statutory protection under FESA.

Species listed or proposed for listing as threatened or endangered are discussed in Section 2.19.

Federal laws and regulations pertaining to wildlife include the following:

- NEPA
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations pertaining to wildlife include the following:

- CEQA
- Section 1600 et seq. of the California Fish and Game Code
- Section 4150 and 4152 of the California Fish and Game Code

2.18.2 Affected Environment

Due to the relatively undeveloped and open nature of the ESL, many wildlife species are likely to move through the area. Wildlife expected to occur in and around the ESL include primarily birds and mammals, but it is expected that frogs and possibly turtles use the aquatic resources in Thurston Creek. The majority of the habitats are upland, although some aquatic habitat occurs in Thurston Creek, in seasonal wetland areas along the highway, and at an artificial pond.

Potential nesting habitat for migratory birds includes the riparian vegetation and oak woodland communities that occur in the ESL. In addition, purple martins were observed nesting in powerline crossarms near the SR 29/281/Red Hills Road intersection.

The special-status animal species listed in Table 2.18-1 are those known to occur, or are considered likely to occur, in the ESL. A discussion for each of these species

follows Table 2.18-1. A complete list of regional species and habitats of concern is included in Appendix H. Threatened and endangered species are listed in Table 2.19-1.

Table 2.18-1 Special-Status Animals Potentially Occurring in the ESL

Scientific Name	Common Name	Status ¹	Habitat Requirements	Habitat Present in ESL	Species Present in ESL	Rationale
Mammals						
<i>Antrozous pallidus</i>	Pallid bat	CSC	Day roost in caves, crevices, mines and occasionally hollow trees and buildings. Night roosts may be more open sites, such as porches and open buildings.	Yes	Yes	Species caught in mist net during bat surveys, and detected at several of the echolocation survey stations within the ESL.
<i>Corynorhinus townsendii townsendii</i>	Townsend's western big-eared bat	FSC; CSC	Roosts in lava tubes, caves, buildings, mines, etc.	Yes	Yes	Townsend's big-eared bat (<i>Corynorhinus townsendii</i>) was identified roosting in three structures within the ESL, and was detected foraging within the ESL.
<i>Myotis evotis</i>	Long-eared myotis bat	FSC	Found in all brush, woodland, and forest habitats from sea level to about 9000 feet. Prefers coniferous woodlands and forests. Nursery colonies in buildings, crevices, spaces under bark, and snags. Caves primarily used for night roosts.	Yes	Unknown	Note: This species may have been detected at one of the survey stations, but a positive identification could not be reached. Potential habitat occurs in the ESL, and this species could be present.
<i>Myotis thysanodes</i>	Fringed myotis bat	FSC	In a wide variety of habitats. Optimal habitats include pinyon-juniper, valley foothill hardwood, and hardwood-conifer. Uses caves, mines, buildings, or crevices for maternity colonies and roosts.	Yes	Unknown	Note: This species may have been detected at one of the survey stations, but a positive identification could not be reached. Potential habitat occurs in the ESL, and this species could be present.
<i>Myotis yumanensis</i>	Yuma myotis bat	FSC	Optimal habitats are open forests and woodlands with sources of water over which to feed. Distribution is closely tied to bodies of water. Maternity colonies in caves, mines, buildings, or crevices.	Yes	Yes	Species caught in mist net during bat surveys, and detected at several of the echolocation survey stations within the ESL. A pregnant female was observed roosting in a building within the ESL.

Table 2.18-1 Special-Status Animals Potentially Occurring in the ESL (continued)

Scientific Name	Common Name	Status ¹	Habitat Requirements	Habitat Present in ESL	Species Present in ESL	Rationale
Birds						
<i>Accipiter cooperii</i>	Cooper's hawk	CSC	Nesting in chiefly open woodlands, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms or river flood-plains; also live oaks.	Yes	Yes	Species detected within the ESL. Suitable nesting habitat present in the ESL, but no nests were observed.
<i>Baeolophus inornatus</i>	Oak titmouse	FSLC	Montane hardwood-conifer, montane hardwood, oak woodland, arborescent chaparral, and montane and valley foothill riparian habitats. Primarily associated with oaks.	Yes	Yes	Species detected within the ESL. Suitable nesting habitat present in the ESL, but no nests were observed.
<i>Carduelis lawrencei</i>	Lawrence's goldfinch	FSC	Nests in open oak woodland, chaparral, riparian woodland, pinyon-juniper association, and weedy areas in arid regions but usually near water. Often nests in dense foliage in conifers, 3 to 40 feet above ground.	Yes	Yes	Species detected within the ESL. Suitable nesting habitat present in the ESL, but no nests were observed.
<i>Contopus cooperi</i>	Olive-sided flycatcher	FSC	Open montane and boreal conifer forests; nest in mixed conifer forests.	Yes	Yes	Species detected within the ESL. Suitable nesting habitat present in the ESL, but no nests were observed.
<i>Dendroica petechia brewsteri</i>	Yellow warbler	CSC	Nesting in riparian habitats and prefers willows, cottonwoods, aspens, sycamores, and alders for both nesting and foraging. Also nests in montane shrubbery in open conifer forests.	Yes	Yes	Species detected within the ESL. Suitable nesting habitat present in the ESL, but no nests were observed.
<i>Elanus leucurus</i>	White-tailed kite	FSC	Nesting on rolling foothills/valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodlands. Found in open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Yes	Yes	Species detected within the ESL. Suitable nesting habitat present in the ESL, but no nests were observed.

Table 2.18-1 Special-Status Animals Potentially Occurring in the ESL (concluded)

Scientific Name	Common Name	Status ¹	Habitat Requirements	Habitat Present in ESL	Species Present in ESL	Rationale
<i>Empidonax difficilis</i>	Pacific slope flycatcher	FSC	Widespread, fairly common summer resident in warm moist woodlands, including valley foothill and montane riparian, coastal and blue oak woodlands, and montane hardwood-conifer habitats. Also uses closed-cone pine-cypress, ponderosa pine, Douglas fir, Sierra mixed conifer, and redwood habitats.	Yes	Yes	Species detected within the ESL. Suitable nesting habitat present in the ESL, but no nests were observed.
<i>Progne subis</i>	Purple martin	CSC	Uncommon to rare local summer resident. Occurs in valley foothill and montane hardwood, valley foothill and montane hardwood-conifer, conifer forests and riparian habitats.	Yes	Yes	Five purple martin nests were identified within or adjacent to the ESL.
<i>Toxostoma redivivum</i>	California thrasher	FSC	Occupies moderate to dense lowland and coastal chaparral, and riparian thickets. Usually on or near ground. During breeding, nests in bushes or small trees. Nest constructed by both adults.	Yes	Yes	Species detected within the ESL. Suitable nesting habitat present in the ESL, but no nests were observed.
Reptiles						
<i>Clemmys marmorata marmorata</i>	Northwestern pond turtle	FSC; CSC	Associated with permanent or nearly permanent water sources with basking sites, in a wide variety of habitats. Nest sites may be found up to 0.3 mile from water.	Yes	Unknown	Note: Suitable western pond turtle habitat is present in Thurston Creek. Several occurrences have been recorded within close proximity to the ESL, but this species was not observed during focused surveys in the ESL.

¹ CSC = California Species of Concern; FSC = Federal Species of Concern; FSLC = Federal Species of Local Concern; FT = Federal Threatened

2.18.3 Impacts

2.18.3.1 No Build Alternative

The No Build Alternative would not modify SR 29; therefore, no impacts to special-status animal species would occur.

2.18.3.2 All Build Alternatives

After further evaluation of the special-status wildlife species potentially occurring in the ESL, as shown in Table 2.18-1, the following species were determined to have a

reasonable likelihood of occurring in the ESL and being affected by the project alternatives.

Bat Species

Bats detected during surveys include pallid bat (*Antrozous pallidus*), Yuma myotis bat (*Myotis yumanensis*), and Townsend's western big-eared bat (*Corynorhinus townsendii townsendii*), although habitat suitable for other bat species is present within the ESL. Long-eared myotis (*Myotis evotis*) and fringed myotis bat (*Myotis thysanode*) may have been detected within the ESL, but a positive identification could not be reached. None of these species are federally or state listed as threatened or endangered but are California species of special concern and/or were previously designated as federal species of concern.

Field surveys conducted in June and August 2003 indicated that bats are roosting in several of the unoccupied buildings along the proposed project corridor. All buildings in the ESL could not be surveyed due to limited access, and some of those buildings could provide roosting habitat. Townsend's big-eared bat, pallid bat, and Yuma myotis were observed roosting in the buildings in the ESL. Several large trees and snags in the ESL provide potential roosting habitat for bats, including special-status bats. The ESL provides excellent bat foraging habitat, and bats were observed foraging in most habitat types including oak woodland, nonnative grassland, wetlands, and agricultural areas and around buildings.

Depending upon the alternative selected, project construction would require the removal of up to approximately 87.6 acres of mature woody vegetation (including all types of oak woodlands, foothill pine woodland and knobcone pine forest habitats, and valley oak riparian habitat). The removal of unoccupied buildings in which bats are roosting may also be required. Maternity colonies roosting in trees and buildings could be harmed if vegetation (including trees) and/or building removal is performed during the summer breeding period. The removal of vegetation (including trees) or buildings during winter has the potential to harm hibernating bats. The project may result in permanent loss of bat foraging and roosting habitat.

Temporary project impacts on bats could include possible disruption of breeding and foraging, and increased stress from the presence of construction equipment and personnel. The restriction of the timing of vegetation removal (including trees) and buildings and the establishment of protective buffers around known roosting sites are expected to avoid substantial adverse effects to bat populations.

Raptor and Migratory Songbird Species

Several potential raptor nests were identified along the ESL but were determined to be inactive. In addition, one active raptor nest (red-shouldered hawk [*Buteo lineatus*]) was identified in the ESL during the 2002 bird surveys. Another pair of red-shouldered hawks was observed in approximately the same location during the following year, but no nest was located. Two special-status raptor species, white-tailed kite (*Elanus leucurus*) and Cooper's hawk (*Accipiter cooperii*), were recorded foraging in the ESL. Nesting habitat for these two species is present in the ESL, but no nests were identified.

Surveys were conducted for several songbird species. Species detected within the ESL include oak titmouse (*Baeolophus inornatus*), Lawrence's goldfinch (*Carduelis lawrencei*), olive-sided flycatcher (*Contopus cooperi*), yellow warbler (*Dendroica petechia brewsteri*), Pacific slope flycatcher (*Empidonax difficilis*), purple martin (*Progne subis*), and California thrasher (*Toxostoma redivivum*). Lawrence's goldfinch, olive-sided flycatcher, Pacific slope flycatcher, and California thrasher were previously considered federal species of concern; oak titmouse was considered a federal species of local concern; and yellow warbler and purple martin are California species of special concern. None of these species are listed as threatened or endangered.

Five purple martin nests were identified within or adjacent to the ESL near the SR 29/281/Red Hills Road intersection. No other songbird nests were recorded during wildlife surveys, but potential nesting habitat is present within the ESL.

Depending upon the alternative selected, project construction would require the removal of up to approximately 87.6 acres of mature woody vegetation (including all types of oak woodlands, foothill pine woodland and knobcone pine forest habitats, and valley oak riparian habitat). This vegetation is likely to support reproducing raptors, migratory songbirds, and other bird species during the nesting season (March 1 to September 1). The removal of woody vegetation could affect nesting birds. However, restricting the timing of vegetation removal and maintaining protective buffers around known nest sites are expected to avoid adverse effects to nesting bird populations. Construction noise and activities within the project area may also temporarily disrupt normal foraging or movement patterns of raptors, migratory songbirds, and other migratory birds within the project vicinity, but disruption is unlikely due to the project's proximity to the highway system. If possible, woody

vegetation removal will be conducted outside of the expected nesting season for migratory birds.

Reptile Species

The northwestern pond turtle (*Clemmys marmorata marmorata*) was previously considered a federal species of concern and is a California species of concern. The pond turtle can thrive in a variety of habitats that are associated with permanent or nearly permanent water sources, including woodlands, grasslands, and open forests. The species can occupy ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms. Nest sites may be found up to 0.3 mile from water.

Although several occurrences of northwestern pond turtle have been recorded near the ESL, none were observed in any potentially suitable habitat areas located within the ESL.

2.18.4 Avoidance, Minimization, and Mitigation Measures

2.18.4.1 Avoidance and Minimization Measures

Bat Species

Implementation of the following avoidance and minimization measures will reduce impacts to special-status bat species.

- Tree and vegetation removal will be limited to that required to construct the project.
- A qualified bat biologist will conduct a habitat assessment of all buildings and large trees (>16 inch diameter at breast height [dbh]) on-site, at least 30 days prior to demolition of the structures, removal of trees, or groundbreaking within 100 feet of structures or trees. If no bats, evidence of bat roosting activity, or openings into the structures suitable for bats are found, demolition can occur at the recommendation of the biologist.
- If the bat biologist observes special-status bat species, evidence of their presence, evidence of past roosting activity by bats, or openings into the buildings or trees suitable for bats, the biologist will provide specific recommendations for the following: 1) focused surveys to determine presence or absence, location of roost, species and population; 2) eviction, sealing of openings (exclusionary devices) and/or partial dismantling; or 3) timing of demolition. If roosting bats are discovered, work windows may be required during the maternity season or hibernation to avoid mortality of young or torpid bats incapable of flight. These work windows will apply to the demolition of any buildings that are acquired.

Work windows will be determined in consultation with CDFG and will be based on the identification of the affected species. Structures identified as potential night roosts only (not day roosts) will be demolished during the day when no bats are occupying the structure.

- Many bat species are very sensitive to human visitation and sound. The use of lights during night work may also be disruptive to roosting bats. Construction buffer zones in which restrictions are placed on night work and the use of lights may also be required if roosting bats are discovered. Buffer zones will be determined in consultation with CDFG and will be based on the identification of the affected species.

The above avoidance and minimization measures will ensure that no effects will occur to special-status bat species; therefore, no mitigation measures are required.

Raptor and Migratory Songbird Species

Tree and vegetation removal will be conducted between September 15 and February 15. If removal cannot be conducted during this time frame, a preconstruction survey will be conducted by a qualified biologist no more than 10 days prior to the start of construction. If raptors, migratory songbirds, or other migratory birds are observed nesting, CDFG will be contacted and a work window may be implemented for portions of the project, depending on the proximity to the nest. Impacts to migratory birds will be avoided through the inclusion of the nonstandard special provision for “Migratory Bird Protection” in the project’s Plans, Specifications, and Estimates package.

The above avoidance and minimization measures will ensure that no effects will occur to raptor and migratory songbird species; therefore, no mitigation measures are required.

Reptile Species

Due to the negative results of surveys for this species in areas of suitable habitat within the ESL, it is unlikely that the build alternatives would impact the northwestern pond turtle. However, a preconstruction survey for the northwestern pond turtle will be completed before the project commences to ensure that there are no impacts to this species.

2.19 Threatened and Endangered Species

2.19.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the FESA (16 USC 1531 et seq.; see also 50 CFR Part 402). This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems on which they depend. Under Section 7 of FESA, federal agencies such as FHWA are required to consult with USFWS and NOAA Fisheries to ensure that they are not undertaking, funding, permitting or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 is a Biological Opinion and, if needed, an Incidental Take Statement. Section 3 of FESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

California has enacted a similar law at the state level, CESA (California Fish and Game Code Section 2050 et seq.) This act emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. The CDFG is the agency responsible for implementing CESA. Section 2081 of the California Fish and Game Code prohibits the “take” of any species determined to be an endangered species or a threatened species. “Take” is defined in Section 86 of the California Fish and Game Code as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” The CESA permits a take incidental to otherwise lawful development projects; for these actions, an incidental take permit is issued by CDFG. For projects requiring a Biological Opinion under Section 7 of FESA, CDFG may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the California Fish and Game Code.

2.19.2 Affected Environment

An updated list of threatened and endangered species was requested and received from USFWS on April 26, 2007. The complete list is included in Appendix I. Table 2.19-1 lists threatened and endangered plant and animal species with a real potential to occur within the ESL based on specific habitat requirements. If a species is known to occur in the ESL, or could potentially occur but presence/absence surveys were not

conducted, additional discussion is provided for each species below. If, after further investigation, it was determined that a species is not likely to occur in the ESL or presence/absence surveys produced negative results, this information is documented and no further discussion is provided.

Table 2.19-1 Threatened and Endangered Species Potentially Occurring in the ESL

Scientific Name	Common Name	Status ¹	Habitat Requirements	Habitat Present in ESL	Species Present in ESL	Rationale
Reptiles						
<i>Rana aurora draytonii</i>	California red-legged frog	FT	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to aestivation habitat.	Yes	No	Note: No known existing populations in Lake County. Thurston Creek is an intermittent stream. Most of the potential habitat located along the creek appears to be dry by early to mid-summer.
Invertebrates						
<i>Desmocerus californicus dimorphus</i>	Valley elderberry longhorn beetle	FT	Occurs only in the Central Valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Preferable to branches greater than 1 inch in diameter.	Yes	Unknown	Elderberry plants present in project area. No records from project area or elsewhere in Lake County. The USFWS currently considers Lake County to be within the range of this species.
Plants						
<i>Lasthenia burkei</i>	Burke's goldfields	FE, SE	Vernal pools and meadows from 50 to 1,970 feet.	Yes	Yes	Several populations of this species were identified in the ESL.
<i>Navarretia leucocephala</i> ssp. <i>pauciflora</i>	Few-flowered navarretia	FE, ST	Vernal pools within volcanic ash flow from 1,310 to 3,120 feet.	Yes	Yes	Several populations of few-flowered navarretia were identified in the ESL.
<i>Parvisedum leiocarpum</i>	Lake County stonecrop	FE, SE	Cismontane woodland, valley and foothill grassland, and vernal mesic depressions in volcanic outcrops from 1,200 to 2,590 feet.	Yes	Yes	Four populations of Lake County stonecrop were identified in the ESL.

¹ FE = Federal Endangered; FT = Federal Threatened; SE = State Endangered

2.19.3 Impacts

2.19.3.1 No Build Alternative

The No Build Alternative would not modify SR 29; therefore, no impacts to threatened or endangered species would occur.

2.19.3.2 All Build Alternatives

Each of the proposed build alternatives would result in impacts to species listed as threatened or endangered under FESA and/or CESA. Tables 2.19-2 and 2.19-3, respectively, list the invertebrate and plant species under the jurisdiction of USFWS and/or CDFG that would be potentially affected by the project alternatives.

Table 2.19-2 Potential Impacts to Threatened and Endangered Invertebrate Species with Signalized Intersection

Invertebrate Species	Elderberry bushes removed by alternative			
	C1	C2	C3	D
Valley elderberry longhorn beetle	65	91	74	75

Table 2.19-3 Potential Impacts to Threatened and Endangered Plant Species with Signalized Intersection

Plant Species	Acres affected, by Alternative			
	C1	C2	C3	D
Burke's goldfields	0.101	0.101	0.101	0
Burke's goldfields and woolly Meadowfoam ²⁸	0.732	0.095	0.885	0
Few-flowered navarretia	0.274	0.051	0.271	0
Lake County stonecrop	0.077	0.091	0.062	0

California Red-Legged Frog

The California red-legged frog (*Rana aurora draytonii*) is a federally listed threatened species that occurs in lowlands and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation.

No California red-legged frogs were observed in any potentially suitable habitat areas located within 1 mile of the project area. Thurston Creek is an intermittent stream. Most of the potential habitat located along the creek appears to be dry by early to mid-summer and would be only marginally suitable for adult California red-legged

²⁸ In two areas, these species were mapped together. For mitigation purposes, this area will be counted as Burke's goldfields.

frogs. These locations are unlikely to provide conditions suitable to support a reproductive population. Currently, no known populations of California red-legged frogs exist in Lake County. Many of the suitable habitats in the Clear Lake/Thurston Lake watersheds have become infested with introduced species such as warmwater fish, crayfish, and bullfrogs (*Rana catesbeiana*). Bullfrogs are known predators of California red-legged frogs. The presence of these introduced species is likely to prevent the recolonization of suitable habitat by red-legged frogs.

Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) was listed as a threatened species on August 8, 1980 (Federal Register 45: 52803–52807). The valley elderberry longhorn beetle is completely dependent on its host plant, elderberry (*Sambucus* species), which is a common component of the remaining riparian forests and adjacent upland habitats of California's Central Valley. Use of the elderberry by the beetle, a wood borer, is rarely apparent. Frequently, the only exterior evidence of the elderberry's use by the beetle is an exit hole created by the larva just prior to the pupal stage. The life cycle takes one or two years to complete. The animal spends most of its life in the larval stage, living within the stems of an elderberry plant. Adult emergence is from late March through June, about the same time the elderberry produces flowers. The adult stage is short-lived. Further information on the life history, ecology, behavior, and distribution of the beetle can be found in the *Distribution, Habitat, and Status of the Valley Elderberry Longhorn Beetle* (Barr 1991) and the *Recovery Plan for the Valley Longhorn Elderberry Beetle* (USFWS 1984).

Elderberry bushes exist throughout the entire project area, within the ESL. Depending on the build alternative, between 65 and 91 elderberry bushes would be affected.

Burke's Goldfields

Burke's goldfields (*Lasthenia burkei*) is a federal and state listed endangered species and a CNPS List 1B species. This plant occurs in vernal pools, seeps, and meadows.

Several populations of Burke's goldfields were identified at Manning Flat and in the vernal pools north of the intersection of SR 29 and Konocti Conservation Camp Road. The populations ranged from a few individuals to several thousand individuals.

All of the proposed build alternatives except Alternative D would have similar impacts to Burke's goldfields. Alternatives C1, C2, and C3 would affect Burke's

goldfield populations in two vernal pools in Manning Flat on the south side of SR 29. Several hundred individual plants were identified in the small pool during plant surveys, and many thousands of plants were identified in the larger pool. Alternative D would not affect Burke's goldfields.

Alternatives C1, C2, and C3 would likely result in indirect effects to Burke's goldfields. Alternative D is not expected to result in indirect effects to the species.

Few-Flowered Navarretia

Few-flowered navarretia (*Navarretia leucocephala* ssp. *pauciflora*) is federally listed as endangered, state listed as threatened, and a CNPS List 1B species. This plant occurs in vernal pools within volcanic ash flow, and is only known from six occurrences.

Several populations of few-flowered navarretia were identified at Manning Flat and in the vernal pools north of the intersection of SR 29 and Konocti Conservation Camp Road. A previous sighting of this species in Manning Flat (CNDDDB 2003) could not be relocated during the 2003 surveys, but other populations were found nearby. Populations ranged from a few individuals to several thousands of individuals. Alternatives C1, C2, and C3 would have direct impacts on few-flowered navarretia populations. Alternative D, which avoids the Manning Flat area, would have no direct impacts on this species.

Alternatives C1, C2, and C3 would likely result in indirect effects to few-flowered navarretia. Alternative D is not expected to result in indirect effects to the species.

Lake County Stonecrop

Lake County stonecrop (*Parvisedum leiocarpum*) is an annual herb that is a federal- and state-listed endangered species and a CNPS List 1B species. Lake County stonecrop occurs in vernal pools and rocky depressions in cismontane woodland and valley and foothill grassland habitats. The species is known from fewer than five occurrences.

Four populations of Lake County stonecrop were identified in the ESL at Manning Flat. Populations ranged from hundreds to tens of thousands of individuals.

Alternatives C1, C2, and C3 would have similar impacts on Lake County stonecrop. The alternatives would affect two to three populations of this species in Manning Flat, ranging from approximately 200 individuals to tens of thousands of individuals.

Alternatives C1, C2, and C3 are also likely to result in indirect impacts on Lake County stonecrop.

Alternative D is not expected to have direct or indirect impacts on the species.

2.19.4 Avoidance, Minimization, and Mitigation Measures

2.19.4.1 Avoidance and Minimization Measures

California Red-Legged Frog

Due to the negative results of surveys for this species in the Clear Lake/Thurston Lake watershed along with the marginal habitat and presence of introduced predators in Thurston Creek, it is unlikely that the build alternatives would impact the California red-legged frog. However, a preconstruction survey for California red-legged frog in Thurston Creek will be completed before the project commences.

Valley Elderberry Longhorn Beetle

Elderberry bushes that are to remain within and adjacent to the proposed project will be designated as ESAs and will be temporarily fenced with orange plastic construction (exclusion) fencing throughout all grading and construction activities. The exclusion fencing will be a minimum 4-foot-tall temporary, plastic mesh construction fence (Tensor Polygrid or equivalent) and will be installed at least 20 feet from the driplines of elderberry shrubs that are not to be removed. The fencing is intended to prevent encroachment by construction vehicles and personnel. The exact location of the fencing will be determined by a qualified biologist, with the goal of protecting the valley elderberry longhorn beetle habitat.

Burke's Goldfields, Few-Flowered Navarretia, and Lake County Stonecrop

Caltrans has made substantial revisions to the design of Alternative D in order to avoid potential direct and indirect effects to Burke's goldfields, few-flowered navarretia, and Lake County stonecrop. Alternative D, the Caltrans preferred alternative, is not expected to result in direct or indirect effects to these species. Alternatives C1, C2, and C3 will result in direct effects and potential indirect effects to these species. If further surveys reveal additional populations of these species within the project corridor, and it is subsequently determined that Alternative D may result in effects to these species, further revisions to the Alternative D alignment may be considered to avoid effects to these species (see Section 4.6 regarding ongoing efforts to avoid project impacts to these endangered plants).

2.19.4.2 Mitigation Measures

Valley Elderberry Longhorn Beetle

- All elderberry shrubs with one or more stems measuring 1 inch or more in diameter that cannot be avoided during construction will be transplanted to a conservation area in accordance with Conservation Guidelines for Valley Elderberry Longhorn Beetle (USFWS 1999). If an elderberry shrub is unlikely to survive transplantation because of poor condition or location, the shrub may be exempted from transplantation at the discretion of USFWS.
- Each elderberry stem measuring 1.0 inch or greater in diameter at ground level that is transplanted or removed by this project will be replaced, in the conservation area, with elderberry seedlings or cuttings at a ratio ranging from 1:1 to 8:1 (new plantings to affected stems) in accordance with Conservation Guidelines for Valley Elderberry Longhorn Beetle (USFWS 1999).

Burke's Goldfields, Few-Flowered Navarretia, and Lake County Stonecrop

If further surveys reveal additional populations of Burke's goldfields, few-flowered navarretia, or Lake County stonecrop within the project corridor, and it is subsequently determined that Alternative D may result in effects to these species, further revisions to the Alternative D alignment may be considered to avoid effects to these species. If further avoidance measures cannot be implemented, or if Alternative C1, C2, or C3 is selected, Caltrans will work with USFWS and CDFG to develop appropriate mitigation strategies to minimize/mitigate for effects to these endangered plants and include these mitigation strategies in the Habitat Mitigation and Monitoring Plan that will be prepared for the project.

Compensatory mitigation is the most likely mitigation strategy for impacts to these species and would most likely be implemented through the establishment of conservation easements. A conservation easement is a legal agreement that a property owner enters into with a land trust or public agency restricting types and amounts of development and other uses. Each conservation easement is different and tailored to the needs of the owner. Once the conservation easement is finalized, a land trust, nonprofit, or public agency monitors the land to ensure that its provisions are followed. The easement remains in perpetuity with the title, even when the land changes ownership by sale, death, or gift.

2.20 Invasive Species

2.20.1 Regulatory Setting

Executive Order 13112 requires federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.”

FHWA guidance issued on 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.

2.20.2 Affected Area

The ESL contains several areas of high-quality habitat. Although many nonnative plant species occur in the ESL, no large patches of invasive are species present.

2.20.3 Impacts

2.20.3.1 No Build Alternative

The No Build Alternative would not modify SR 29; therefore, no impacts due to invasive species would occur.

2.20.3.2 All Build Alternatives

Nonnative plant seeds could be transported to the project site from earthmoving and seeding equipment such as backhoes, bulldozers, and hydroseed trucks. Project construction activities would disturb and remove native vegetation, which would increase the opportunity for nonnative or invasive species to become established throughout the project area. If nonnative or invasive species are allowed to be transported to the project site or planted as part of revegetation activities, they could become dominant in the disturbed areas. These species would not provide the same cover and wildlife habitat as the existing riparian vegetation, resulting in potential impacts to species that use these habitats. However, with the following measures, these impacts would be avoided.

2.20.4 Avoidance, Minimization, and Mitigation Measures

2.20.4.1 Avoidance and Minimization Measures

To avoid the introduction of invasive species into the ESL during project construction, contract specifications will include, at a minimum, the following measures.

- All earthmoving equipment to be used during project construction will be thoroughly cleaned before arriving on the project site.
- All seeding equipment (e.g., hydroseed trucks) will be thoroughly rinsed at least three times offsite prior to beginning seeding work.
- To avoid spreading nonnative species to off-site areas, all equipment will be thoroughly cleaned before leaving the site.
- Caltrans will not use any of the species on the California list of noxious weeds for erosion control or landscaping.
- The landscaping and erosion control included in the project will not use species listed as noxious weeds. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or adjacent to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

The above avoidance and minimization measures should ensure that no invasive species are introduced into the ESL during project construction; therefore, no mitigation measures are required.

Cumulative Impacts

2.21 Cumulative Impacts

The following discusses the planned growth and projects in the regional area that were evaluated for cumulative impacts. For the purposes of addressing cumulative impacts in this document, other potential projects in the area that might contribute to cumulative effects in the proposed project area were researched. Sources of information included the 2005 Lake County RTP, the Lake County General Plan (Lake County 2006a), the Lake County Community Development Department, and the Lake County Department of Public Works.

Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effects 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.

Nearby Projects Considered for Cumulative Impacts Analysis

Two additional Caltrans projects are planned within the project limits, both of which would add a traffic signal at the SR 29/281/Red Hills Road intersection. The first project, which is still in the environmental and project approval phase, would widen the intersection and add a traffic signal. The second project, which was approved in 2006 and is expected to be constructed in 2007, would add a left-turn lane and a traffic signal.

Of the other transportation projects located within Lake County, the majority are located some distance from the immediate project area in communities such as Middletown, Upper Lake, Clearlake, Clearlake Oaks, and Lakeport. These projects are listed in Table 2.21-1. The majority of these projects are for activities such as shoulder widening, traffic channelization, roadway rehabilitation, and curve

realignments. Each of these projects would include avoidance, minimization, and mitigation measures, as applicable, for any project-related effects.

Although long-range planning goals include upgrading two additional segments of SR 29 to minimum four-lane expressway facility standards, the 2005 RTP notes that these projects are likely or very likely to be beyond the 20-year horizon of the 2005 RTP (Dow and Associates 2005, 30).

Numerous housing developments are planned for the urbanized areas of the county. The largest is the Clear Lake Riviera subdivision, located north of SR 29, which is an approved project that is likely to reach buildout in the next 20 years. This subdivision consists of 2,860 parcels, the majority of which are currently vacant and awaiting single-family housing development. According to the Lake County Community Development Department, a spa project is also proposed along SR 29 near S-Bar-S Quarry Road, although no further information regarding this project is available at this time.

Other residential projects in Lake County are under consideration. These include the 1,000-home Cristallago development, planned for the Lakeport area; several subdivisions in the Middletown area; and 100 residential lots planned for the Meadow View Estates Subdivision in Kelseyville (see Table 2.21-2).

Other trends in the project area have included the clearing of existing vegetation for agricultural lands, particularly vineyards. Between 2002 and 2004, Lake County saw permit applications to allow the planting of over 1,000 acres of vineyards.

Cumulative Land Use Impacts

As noted in Section 2.1.3.2, this project's impacts on existing and planned land uses within the project area are expected to be minimal. Other projects in the vicinity of the Lake 29 Improvement Project area anticipated within the next 20 years, such as other transportation projects and the Clear Lake Riviera subdivision, north of SR 29, would also have a minimal effect on planned land use and would be consistent with Lake County's planning policies. As such, this project's incremental effects, if any, would not produce a cumulatively substantial effect.

Cumulative Growth Impacts

As discussed in Section 2.2, the proposed project may result in a marginal increase in the desirability of residential land in the nearby communities of Kelseyville, Clear Lake Riviera and Lower Lake. Growth within these boundaries that is consistent with

Table 2.21-1 Relevant Transportation Projects

	Route	PM	Work Description (locations are approximate)	EA	Timeline
1	SR 20	R9.4/R12.1	Near Upper Lake—1.1 miles east of Route 29 to 0.1 mile west of Nice-Lucerne Cutoff. Shoulder widening.	43260	Planned
2	SR 20	0.6/11.1	Near Upper Lake—from 0.62 mile east of the Mendocino/Lake County line to 2.8 miles east of the SR 20/29 junction. Rehabilitate roadway.	39930	Planned
3	SR 20	38.5/42.0	East of Clear Lake Oaks—from 1.4 miles east of North Fork Cache Creek Bridge to 1.7 miles west of Walker Ridge Road. Roadway rehabilitation and re-align curve.	4146V	Planned
4	SR 20	12.2/13.6	At Nice from 0.06 mile east of Lucerne cutoff to 0.06 mile west of Sayre Avenue. Continuous two-way left turn lane.	29620	Completed
5	SR 20	31.1/31.8	Near Clearlake Oaks—SR 20 from 0.56 mile west of SR 53 to 0.19 mile east of SR 53 and one SR 53 at SR 20. Modify intersection.	45110	Completed
6	SR 20	38.6/45.3	In Lake County from 4.9 miles west of Walker Ridge Road to 1.2 miles west of Colusa County line. Widen and resurface highway.	27681	Completed
7	SR 20	45.8/46.5	Approximately 15.5 miles east of Clearlake Oaks—from 0.62 mile west of the Colusa County line to the Colusa County line. Re-align curve.	41210	Completed
8	SR 29	7.4/8.0	Near Middletown—from 0.56 mile south to 1.18 miles mile north of Lupiyoma Creek Bridge Road. Shoulder widening.	45470	Planned
9	SR 29	10.9/11.3	Near Middletown—from 0.19 mile south to 0.19 mile north of Hidden Valley Road. Channelize intersection.	46160	Planned
10	SR 29	3.8/4.5	Near Middletown—from 0.2 mile south to 0.2 mile south of Sheveland Road. Widen shoulders and channelize.	46230	Planned
11	SR 29	15.0/15.3	Near Lower Lake—0.1 mile to 0.4 mile north of Hofacker Lane. Shoulder widening.	46290	Planned
12	SR 29	6.3/6.6	Near Middletown—from St. Helena Creek bridge to 0.37 mile north of St. Helena Creek bridge. Left turn channelization.	40860	Completed

Table 2.21-1 Relevant Transportation Projects (concluded)

	Route	PM	Work Description (locations are approximate)	EA	Timeline
13	SR 29	11.7/12.1	Near Middletown—from 0.19 mile south to 0.19 mile north of Spruce Grove Road. Channelize and intersection light.	41190	Completed
14	SR 29	27.4/28.0	Approximately 7.5 miles north of Lower Lake from 0.5 mile south of SR 281 to 0.12 mile north of SR 281. Re-align vertical curve.	41020	Completed
15	SR 29	27.6/28.1	Near Kelseyville—at the intersection of SR 29 and SR 281. Install signal.	47200	Planned
16	SR 29	27.6/028.1	Near Kelseyville—at the intersection of SR 29 and SR 281. Widen and signalization.	46650	Planned
17	SR 29	R37.3/R37.6	Near Kelseyville—from Adobe Creek Bridge to 0.3 mile south of Adobe Creek Bridge. Widen and re-surface.	45510	Completed
18	SR 29	R38.3/R38.9	Near Kelseyville—from 0.3 mile south of Highland Springs Road to 0.3 mile north of Highland Springs Road. Widen and signalization.	34520	Completed
19	SR 53	3.1/7.4	Near Clearlake—from 0.12 mile north of 40th Avenue to 0.37 mile south of junction with SR 20. Rehabilitate roadway.	39860	Planned
20	SR 175	11.8/12.1	Near Cobb—from 0.37 mile east of Wildcat Road to 1.7 miles west of Diener Road. Widen and resurface.	45530	Completed

Table 2.21-2 Relevant Residential Development Projects

	Name	Location	Description	Number of Units	Timeline
1	Vintage Faire	Middletown	Housing Development	146	Tentative Map approved
2	Stonebrook Meadows	Middletown	Housing Development	59	Tentative Map approved
3	Rim Rock Ranch	Middletown	Housing Development	25	Final Map pending
4	Ownbey	Middletown	Housing Development	14	Tentative Map approved
5	Providence Homes	Middletown	Housing Development	30	Tentative Map approved
6	Bud Waddel	Middletown	Housing Development	8	Tentative Map approved
7	Fanucchi	Middletown	Housing Development	3	Tentative Map approved
8	Forrest Glen Estates	Kelseyville	Housing Development	15	Tentative Map approved
9	Meadow View Subdivision	Kelseyville	Housing Development	108	Tentative Map approved
10	Walnut Vista Estates	Kelseyville	Housing Development	6	Final map pending
11	John Van Eck	Soda Bay	Housing Development	16	Tentative Map approved
12	Clear Lake Estates	Kelseyville	Housing Development	12	Tentative Map approved
13	Kaylee Court	Kelseyville	Housing Development	12	Tentative Map approved
14	Robin Hill Partnership	Lakeport	Housing Development	137	Tentative Map approved
15	Park Lake Estates	Nice	Housing Development	69	Tentative Map approved
16	The Orchards	Lower Lake	Housing Development	10	Tentative Map approved
17	Clear Lake Riviera	Clear Lake Riviera	Housing Developemnt	2,860	Approved – buildout expected in 20 years
18	Cristallago	Lakeport	Housing Development	1,000	Planned
Total Units Planned				4,530	

the county's goals and policies would not be considered an adverse impact. This project is not expected to result in development outside of the urban growth boundaries for Kelseyville, Lower Lake, and Clear Lake Riviera, which are identified by Lake County in the *Draft 2006 General Plan Goals and Policies Report*. Past and future development within the project limits has been constrained by both county planning policies and a lack of infrastructure. As such, this project's incremental effects, if any, would not produce a cumulatively substantial effect.

Cumulative Farmlands/Timberlands Impacts

As noted in Section 2.3.3.2, this project will not result in a substantial impact to farmlands. Lake County's planning policies are directed toward preserving and maintaining a viable and diverse agricultural industry within the county and avoiding the extension of services, such as sewer and water lines and roadways into areas preserved for agricultural use. As such, this project's incremental effects, if any, would not produce a cumulatively substantial effect.

Cumulative Community Impacts

Community Cohesion

This project is not expected to result in impacts to community cohesion; therefore, this project would not contribute to cumulative impacts to community cohesion.

Cumulative Economic Impacts

No other known projects would overlap with this project's impacts on the local economy; specifically, no other projects identified would require business relocations. Therefore, the effects of this project would not contribute to cumulative economic impacts.

Cumulative Impact to Utilities and Emergency Services

No other known projects would overlap with the proposed project's impacts on utilities and emergency services. Therefore, this project would not contribute to a cumulative impact to utilities and emergency services.

Cumulative Traffic and Transportation Impacts

This project will increase the capacity of the roadway and improve LOS along SR 29 within the project corridor. No adverse impacts to traffic and transportation are expected to result from this project. Construction impacts are expected to be minor, and a construction staging plan will be developed to maintain traffic flow.

As noted above, two additional Caltrans projects are planned within the project limits, both of which would add a traffic signal at the SR 29/281/Red Hills Road intersection. The first project, which is still in the environmental and project approval phase, would widen the intersection and add a traffic signal. The second project, which was approved in 2006 and is expected to be constructed in 2007, would add a left-turn lane and a traffic signal. As signalization of this intersection is a component of each of the build alternatives considered in this document, these projects would not contribute to a cumulative effect to traffic and transportation.

Cumulative Visual/Aesthetic Impacts

Although this project will result in changes to the visual environment, these effects will be minimized and mitigated for with the implementation of the measures outlined in Section 2.7.4.1. There are no other known projects planned within the immediate vicinity of the project area that would contribute to a cumulative effect to visual resources. Therefore, this project would not contribute to a cumulative impact to the visual environment.

Cumulative Cultural Resources Impacts

To date, only one portion of one prehistoric site within the Area of Direct Impacts has been found eligible for listing in the National Register of Historic Places, and effects to the portion of the site within the ADI will be adverse. Although destruction of archaeological sites within Lake County has occurred in the past and continues as a result of ongoing private development, this project's incremental effects, if any, following the mitigation measures outlined in Section 2.8.4.2, would not produce a cumulatively substantial effect. None of the built environment resources within the APE for the proposed project are eligible for listing in the NRHP or the California Register or for consideration under CEQA; therefore, the project would neither affect nor contribute to a cumulative effect to built environment resources.

Cumulative Hydrology and Floodplain Impacts

This project will not result in a significant floodplain encroachment nor will it support incompatible floodplain development or result in adverse impacts to natural and beneficial floodplain values. Therefore, this project will not contribute to a cumulative effect to hydrology or floodplain impacts.

Cumulative Water Quality and Storm Water Runoff Impacts

This project will not result in substantial adverse changes to water quality or storm water runoff, and no other significant construction activities or projects were

identified within the Thurston Lake watershed within the foreseeable future. Therefore, this project will not contribute to a cumulative effect to water quality.

Cumulative Geology/Soils/Seismic/Topography Impacts

As no geohazard impacts were identified for this project, this project will not contribute to a cumulative effect.

Cumulative Hazardous Waste/Materials Impacts

With the implementation of the avoidance and minimization measures outlined in Section 2.12.4.1, no impacts due to hazardous waste or materials are anticipated. Therefore, the project's incremental effects, if any, would not produce a cumulatively substantial effect.

Cumulative Air Quality Impacts

This project is not expected to result in any substantial impacts to air quality. As noted in Section 2.13.2.2, the Lake County Air Basin is currently classified as being in attainment for all regulated criteria pollutants, meaning that the air pollutant concentrations in the air basin achieve the national and state ambient air quality standards. The Lake County Air Basin is the only air basin in the state that is in attainment of all standards. The Air Quality Analysis Report modeled the vehicular use of the roadway for the years 2011, 2021, and 2031²⁹ and concluded that localized carbon monoxide concentrations would remain below the national and state ambient air quality standards of 9 parts per million. This project's incremental effects, if any, would not produce a cumulatively substantial effect.

Cumulative Noise Impacts

The permanent noise impacts as a result of the proposed project would be directly related to vehicular use of SR 29 within the project limits. As this project will not result in noise impacts, it will not contribute to a cumulative effect.

Cumulative Biological Impacts

This project is expected to result in adverse effects to biological resources; however, avoidance, minimization, and mitigation measures will be implemented to reduce and mitigate for these impacts.

²⁹ The traffic analysis was recently updated using horizon years 2015, 2025, and 2035. Differences in traffic volumes were slight, ranging from 5 to 11 percent. Because these differences were small, the CO estimates have not been recalculated, but are not expected to be substantially different.

Natural Communities

This project will result in impacts to natural communities, including oak woodlands and areas of riparian habitat under the jurisdiction of CDFG. However, the avoidance, minimization, and mitigation strategies outlined in Sections 2.15.3.1 and 2.15.3.2 are expected to reduce and mitigate for these impacts; therefore, this project's incremental effects, if any, would not produce a cumulatively substantial effect.

Wetlands and Other Waters

This project is expected to result in permanent, direct impacts to 7.6 to 10.83 acres (depending upon the alternative and interchange option selected) of wetlands and other waters of the U.S. However, as outlined in Section 2.16.4.2, the goal of the mitigation measures for wetlands and other waters of the U.S. is to achieve no net loss of wetland habitat function and values. Therefore, this project's incremental effects, if any, would not produce a cumulatively substantial effect.

Special-Status Plant Species

This project is expected to result in 33.56 to 71.84 acres (depending upon the alternative and interchange option selected) of impacts to special-status plant species. As outlined in Sections 2.17.4.1 and 2.17.4.2, avoidance, minimization, and mitigation measures will be developed for this project that will reduce or mitigate for these impacts; therefore, this project's incremental effects, if any, would not produce a cumulatively substantial effect.

Special-Status Animal Species

Special-status animal species within the environmental study limits of the project include bat species, raptor and migratory songbird species, and the northwestern pond turtle. With the implementation of the avoidance and minimization measures outlined in Section 2.18.4.1, project-related impacts to these species are not anticipated. Therefore, this project is will not contribute to cumulative effects.

Threatened and Endangered Species

This project is expected to affect between 65 and 91 (depending upon the alternative and interchange option selected) elderberry bushes, which are the host plant for the valley elderberry longhorn beetle, a federally listed threatened species. As outlined in Sections 2.19.4.1 and 2.19.4.2, avoidance, minimization, and mitigation measures will be implemented to avoid or mitigate for these impacts; therefore, this project's incremental effects, if any, would not produce a cumulatively substantial effect.

Depending upon the alternative selected, this project may also result in impacts to Burke's goldfields, few-flowered navarretia, and Lake County stonecrop. Alternatives C1, C2, and C3 are expected to result in both direct and indirect effects to these species. Alternative D is not expected to result in either direct or indirect effects to these species and would not contribute to a cumulative effect. As noted in Section 2.19.4.2, if further surveys reveal additional populations of these species within the project corridor, and it is subsequently determined that Alternative D may result in effects to these species, further revisions to the Alternative D alignment may be considered to avoid effects to these species. If further avoidance measures cannot be implemented, or if Alternative C1, C2, or C3 is selected, Caltrans will work with USFWS and CDFG to develop appropriate mitigation strategies to minimize/mitigate for effects to these endangered plants and include these mitigation strategies in the Habitat Mitigation and Monitoring Plan that will be prepared for the project. Following mitigation, this project's incremental effects, if any, would not produce a cumulatively substantial effect.

Invasive Species

This project is not expected to result in impacts due to the introduction of invasive species. The avoidance and minimization measures outlined in Section 2.20.4.1 should ensure that no invasive species are introduced into the project limits during construction; therefore, this project will not contribute to a cumulative effect.

Chapter 3 California Environmental Quality Act (CEQA) Evaluation

3.1 Determining Significance Under CEQA

The proposed project is a joint project by the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans is the lead agency under CEQA, and FHWA is lead agency under NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an Environmental Impact Statement (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 to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an Environmental Impact Report (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.

3.2 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:

- 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/)

Chapter 2 provides supporting documentation for all CEQA checklist determinations.

CEQA Noise Analysis

It should be noted that the CEQA noise analysis is independent of the NEPA/23 Code of Federal Regulations [CFR] Part 772 analysis discussed in Section 2.14, which focuses on noise abatement criteria. Under CEQA, the assessment entails evaluation of the setting of the noise impact and how large or perceptible any noise increase would be in the given area. When determining whether a noise impact is significant under CEQA, comparison is made between the No Build Alternative noise level and the build alternative noise level.

Table 2.14-2 shows the predicted noise level under the No Build Alternative (Alternative A) and noise levels with Alternatives C1, C2, C3, and D. Project-related noise level changes at occupied residences would range from about -3 to +3 A-weighted decibels (dBA), depending on the alternative. A 3 dBA increase between the no build noise levels and the noise levels with build alternatives would be barely perceptible to the human ear. Therefore, under CEQA, no significant noise impact would occur as a result of the project, and no mitigation is required.

Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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I. AESTHETICS - Would the project:

- | | | | | |
|---|--------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| a) Have a substantial adverse effect on a scenic vista? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a state scenic highway? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) Substantially degrade the existing visual character or quality of the site and its surroundings? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

II. 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 nonagricultural use? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c) Involve other changes in the existing environment which, because of their location or nature, could result in conversion of Farmland, to nonagricultural use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

III. AIR QUALITY - Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Conflict with or obstruct implementation of the applicable air quality plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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d) Expose sensitive receptors to substantial pollutant concentration?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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e) Create objectionable odors affecting a substantial number of people?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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IV. BIOLOGICAL RESOURCES - Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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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 U.S. Fish and Wildlife Service?

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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V. CULTURAL RESOURCES - Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
--------------------------	--------------------------	--------------------------	-------------------------------------

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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d) Disturb any human remains, including those interred outside of formal cemeteries?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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VI. GEOLOGY AND SOILS - Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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ii) Strong seismic ground shaking?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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iii) Seismic-related ground failure, including liquefaction?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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iv) Landslides?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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b) Result in substantial soil erosion or the loss of topsoil?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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VII. HAZARDS AND HAZARDOUS MATERIALS

- Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	-------------------------------------	--------------------------

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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c) Emit hazardous emissions or handle hazardous or acutely hazardous material, substances, or waste within one-quarter mile of an existing or proposed school?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
--------------------------	--------------------------	--------------------------	-------------------------------------

Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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VIII. HYDROLOGY AND WATER QUALITY -

Would the project:

- | | | | | |
|---|--------------------------|--------------------------|-------------------------------------|-------------------------------------|
| a) Violate any water quality standards or waste discharge requirements? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| f) Otherwise substantially degrade water quality? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| j) Inundation by seiche, tsunami, or mudflow? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

IX. LAND USE AND PLANNING - Would the project:

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Physically divide an established community? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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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?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
--------------------------	--------------------------	--------------------------	-------------------------------------

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?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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XI. NOISE - Would the project:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
--------------------------	--------------------------	--------------------------	-------------------------------------

Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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XII. POPULATION AND HOUSING - Would the project:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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XIII. 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

XIV. 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?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
--------------------------	--------------------------	--------------------------	-------------------------------------

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?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
--------------------------	--------------------------	--------------------------	-------------------------------------

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

XV. 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)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d) Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incomplete uses (e.g., farm equipment)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e) Result in inadequate emergency access? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| f) Result in inadequate parking capacity? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

XVI. UTILITY AND SERVICE SYSTEMS - Would the project:

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 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? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
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e) Result in 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?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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g) Comply with federal, state, and local statutes and regulations related to solid waste?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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XVII. 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, or 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?

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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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)?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	-------------------------------------	--------------------------

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

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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3.3 Discussion of Significant Impacts

3.3.1 Significant Environmental Effects of the Proposed Project

The proposed build alternatives would have potentially significant impacts to aesthetics, biological resources, and cultural resources. Accordingly, for the categories listed under the Mandatory Findings of Significance, the build alternatives would have potentially significant impacts to the natural environment and to human beings. However, these impacts would be reduced to less than significant with the implementation of mitigation measures.

The following briefly discusses the significance of, and mitigation measures for, each potential impact under CEQA. The potential impacts and mitigation measures for each environmental area are discussed in detail in Chapter 2. A summary of avoidance, minimization, and mitigation measures is provided in Appendix J.

3.3.2 Unavoidable Significant Environmental Effects

The proposed project would not result in any unavoidable significant environmental impacts.

3.4 Mitigation Measures for Significant Impacts Under CEQA

The following section discusses the CEQA checklist responses and summarizes the mitigation measures for those impacts determined to be significant. The letters that precede the impact labels (such as “Potentially significant impact” or “Less-than-significant impact with mitigation”) correspond to specific CEQA checklist items for the identified resource area.

Impacts Mitigated to a Less-Than-Significant Level

Aesthetics

c) Less-than-significant impact with mitigation

The build alternatives would affect scenic resources visible from the highway, such as flatlands, rolling hills, orchards, vineyards and open meadows. Views of Mount Konocti would be blocked for very short durations while motorists are passing under interchanges.

Mitigation

- A Revegetation and Restoration Plan will be prepared by the project biologist, project landscape architect, and Caltrans revegetation specialist for the project. The revegetation plan will address the following:
 - The revegetation/restoration plan will be designed to minimize soil loss immediately after construction and to revegetate disturbed areas (including areas in which it has been determined that the existing roadway will be obliterated) with native plants for long-term erosion control. The revegetation/restoration plan will be implemented to compensate for the loss and/or disturbance of vegetation on the project site, areas cleared for access, and construction staging areas. The revegetation/restoration plan will also include plans for plantings to soften the appearance of earth embankments constructed within the project area. The restoration plan elements will be graphically depicted on final construction plans, including the location and extent of the driplines for all trees, type and location of any fencing, and equipment storage and staging areas outside of dripline areas.
 - Revegetation and replacement planting will take place within the existing project right of way to the extent feasible.
 - To the extent feasible, native seeds (acorns), cuttings, or container stock regionally appropriate for the project area will be obtained. The project biologist, landscape architect, and/or revegetation specialist will develop a planting plan and pallet, and ensure the required species are available or propagated prior to planting. Plant material in containers larger than 1 gallon will be avoided, if possible.
 - Planting will take place in the fall and winter following the final construction season.
 - A monitoring program will be implemented. Plant establishment periods will be determined by the project landscape architect and the project biologist.
- Where cut slopes shallower than 1:1 are used, the top of the cut will be contour-graded to blend into existing topography.
- Cut and fill slopes should be no steeper than 1:2 and should be 1:4 where possible. If slopes steeper than 1:2 are required, the use of retaining walls should be considered.

Biological Resources

a, b) Less-than-significant impact with mitigation

The proposed build alternatives would affect special-status plant and animal species or their habitats and sensitive natural communities.

Mitigation

Special-Status Plant Species

Mitigation measures for impacts to special-status plants will be determined in consultation with United States Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) and will be based on the identification of the affected species. Mitigation measures will be specified in the project's Habitat Mitigation and Monitoring Plan and may include seed and plant tissue collection from special-status plants to include in the revegetation of disturbed or affected areas. Caltrans may also contribute funds to a specialized bank or conservation fund account to mitigate (offset) impacts to special-status plant species.

Threatened and Endangered Species

Valley Elderberry Longhorn Beetle.

- All elderberry shrubs with one or more stems measuring 1 inch or more in diameter that cannot be avoided during construction will be transplanted to a conservation area in accordance with Conservation Guidelines for Valley Elderberry Longhorn Beetle (USFWS 1999). If an elderberry shrub is unlikely to survive transplantation because of poor condition or location, the shrub may be exempted from transplantation at the discretion of USFWS.
- Each elderberry stem measuring 1.0 inch or greater in diameter at ground level that is transplanted or removed by this project will be replaced, in the conservation area, with elderberry seedlings or cuttings at a ratio ranging from 1:1 to 8:1 (new plantings to affected stems) in accordance with Conservation Guidelines for Valley Elderberry Longhorn Beetle (USFWS 1999).

Burke's Goldfields, Few-Flowered Navarretia, and Lake County Stonecrop.

Alternative D has been identified as the Caltrans preferred project alternative and is not expected to result in either direct or indirect effects to Burke's goldfields, few-

flowered navarretia, or Lake County stonecrop; therefore, no mitigation measures are required for this alternative.

Alternatives C1, C2, and C3 will result in direct, and possibly indirect, effects to each of these species.

If further surveys reveal additional populations of Burke's goldfields, few-flowered navarretia, or Lake County stonecrop within the project corridor, and it is subsequently determined that Alternative D may result in effects to these species, further revisions to the Alternative D alignment may be considered to avoid effects to these species. If further avoidance measures cannot be implemented, or if Alternative C1, C2, or C3 is selected, Caltrans will work with USFWS and CDFG to develop appropriate mitigation strategies to minimize/mitigate for effects to these endangered plants and include these mitigation strategies in the Habitat Mitigation and Monitoring Plan that will be prepared for the project.

Compensatory mitigation is the most likely mitigation strategy for impacts to these species and would most likely be implemented through the establishment of conservation easements. A conservation easement is a legal agreement that a property owner enters into with a land trust or public agency restricting types and amounts of development and other uses. Each conservation easement is different and tailored to the needs of the owner. Once the conservation easement is finalized, a land trust, nonprofit, or public agency monitors the land to ensure that its provisions are followed. The easement remains in perpetuity with the title, even when the land changes ownership by sale, death, or gift.

Natural Communities

Mitigation will be required for impacts to riparian habitat under the jurisdiction of CDFG, including valley oak riparian habitat. The majority of the riparian habitat affected by the project is also under the jurisdiction of USACE. A Habitat Mitigation and Monitoring Plan will be prepared that will include specific mitigation measures for impacts to remaining areas of riparian habitat. The plan will include compensation requirements for unavoidable impacts to riparian habitat, based on the selected alternative. The plan will provide specific mitigation details, including approved mitigation sites, plan implementation design and construction, and a minimum five-year monitoring plan. Mitigation measures will be developed in coordination with the resource agencies and will include all necessary measures to offset project effects. Mitigation for the loss of riparian habitat may include purchase

of lands within the project area or at off-site locations that are approved by the resource agencies and that will provide opportunities to enhance and create riparian habitat.

c) Less-than-significant impact with mitigation

The proposed build alternatives would affect federally protected wetlands.

Mitigation

- Project construction activities within aquatic features will not take place until there is a low-flow condition.
- All waters and wetlands adjacent to the construction zone that will not be filled as a result of the project will be designated as Environmentally Sensitive Areas (ESAs), and shall be fenced and signed to prevent inadvertent damage to these resources. Best management practices will be followed to minimize erosion and reduce sediments from entering channels and wetlands. All disturbed areas will be replanted upon completion of construction to stabilize soils.
- The proposed project will require a Clean Water Act Section 404 permit from USACE and a Section 401 Water Quality Certification from the California RWQCB. A Streambed Alteration Agreement will also be required from CDFG for work in Thurston Creek. Conditions of these permits will include timing restrictions (work during low-flow periods, typically from June 15 to October 1) to avoid water quality and species related impacts, and the restoration of native riparian vegetation affected by project construction.
- A Habitat Mitigation and Monitoring Plan will be prepared that will include specific mitigation measures for impacts to wetlands and other waters of the U.S. The plan will include compensation requirements for unavoidable impacts to wetlands and other waters of the U.S., based on the selected alternative. The plan will provide specific mitigation details, including approved mitigation sites, plan implementation design and construction, and a minimum five-year monitoring plan. Mitigation measures will be developed in coordination with the resource agencies and will include all necessary measures to offset project effects. The goal of the mitigation plan is to achieve no net loss of wetland habitat functions and values. Compensation wetlands will be designed to equal or exceed the values of wetlands affected by the project. Mitigation for the loss of wetlands and other waters of the U.S. may include purchase of lands within the project area, or at off-

site locations that are approved by the resource agencies and that will provide opportunities to enhance and create wetland features and stream channels.

Cultural Resources

b) Less-than-significant impact with mitigation

A portion of one prehistoric site that falls within the Area of Direct Impact of all build alternatives has been found to be eligible for the National Register of Historic Places (NRHP).

Mitigation

Archaeological deposits within historic properties contain data necessary to address substantive regional research issues. Mitigation measures will be implemented to recover these data prior to the destruction of deposits through controlled excavations and subsequent laboratory analysis of recovered materials.

At this time, the number of archaeological properties requiring mitigation is unknown, as additional evaluations are required due to recent revisions to Alternative D. Once the additional evaluations are completed, the criteria of adverse effect can then be applied to those sites found to be eligible for NRHP listing, and consultations can occur regarding the resolution of potential adverse effects.

In order to mitigate for adverse effects of the project on archaeological sites found eligible for NRHP listing, a Phase III data recovery investigation will be implemented, in accordance with the terms of a Memorandum of Agreement that will be executed between FHWA and SHPO. The Memorandum of Agreement details the measures to be taken to complete the Phase III data recovery investigation.

3.5 Other Regulatory Considerations

Climate Change

Regulatory Setting

While climate change has been a concern since at least 1988 as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to

greenhouse gas³⁰ (GHG) emissions reduction and climate change research and policy has increased dramatically in recent years. In 2002, with the passage of Assembly Bill (AB) 1493, California launched an innovative and proactive approach to dealing with GHG emissions and climate change at the state level. AB 1493 requires the California Air Resources Board (CARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These regulations will apply to automobiles and light trucks beginning with the 2009 model year.

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

Climate change and GHG emissions reduction are also a concern at the federal level; however, at this time, no legislation or regulations have been enacted that specifically address these issues.

Affected Environment

According to a recent white paper by the Association of Environmental Professionals (Hendrix and Cori 2007), "an individual project does not generate enough greenhouse gas emissions to significantly influence global climate change. Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of greenhouse gases."

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from

³⁰ Greenhouse gases related to human activity include carbon dioxide, methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, trifluoromethane (HFC-23), 1,1,1,2-tetrafluoroethane (HFC-134a), and 1,1-difluoroethane (HFC-152a).

transportation, Caltrans has created and is implementing the *Climate Action Program at Caltrans* (December; Caltrans 2006d).

One of the main strategies to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0 to 25 miles per hour) and speeds over 55 miles per hour. Relieving congestion by enhancing operations and improving travel times in high-congestion travel corridors will lead to an overall reduction in GHG emissions.

Impacts

The purpose of this project is to provide a modern transportation facility that will provide adequate capacity to accommodate anticipated traffic growth. Traffic volumes on SR 29 within the project limits are expected to increase by 80 percent over the next 20 years. By the year 2035 the LOS is expected to deteriorate to E, causing significant delays if no capacity-increasing improvements are made. For that reason, implementation of the proposed project would improve the level of service, volume-to-capacity ratio, and traffic queuing, and decrease traffic delays over both existing conditions and the projected conditions under the No Build Alternative. Improvements to the Principal Arterial Corridor, including this project, are identified as the highest-priority improvements for the State Highway System in the 2005 *Lake County Regional Transportation Plan*. The anticipated improvements to traffic flow and the reduction in traffic congestion are expected to reduce carbon dioxide emissions.

Conclusion

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

Caltrans continues to be actively involved on the Governor's Climate Action Team as ARB works to implement AB 1493 and AB 32. As part of the Climate Action Program at Caltrans (December 2006), the Department is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies:

job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars and light- and heavy-duty trucks. However, it is important to note that the control of the fuel economy standards is held by the United States Environmental Protection Agency and CARB. Lastly, the use of alternative fuels is also being considered; Caltrans is participating in funding for alternative fuel research at the University of California at Davis.

Chapter 4 Comments 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 (PDT) meetings, interagency coordination meetings, the development of a project website, and a public open house. This chapter summarizes the results of Caltrans' efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

4.1 Responsible Agencies Under CEQA

Because of their jurisdiction by law, the following state agencies or officers will issue permits or approval for the project:

- California Department of Fish and Game (CDFG)
- California State Historic Preservation Officer (SHPO)
- Central Valley Regional Water Quality Control Board (RWQCB)

The United States Army Corps of Engineers (USACE), United States Environmental Protection Agency (USEPA), and United States Fish and Wildlife Service (USFWS), have had the opportunity to participate in this project since March 2003 through the National Environmental Policy Act/Clean Water Act Section 404 (NEPA/404) integration process, and coordination with these agencies has been ongoing. Although not a Signatory Agency, CDFG has also been invited to participate in the NEPA/404 process for this project due to its role as a Trustee Agency. These agencies have been invited to NEPA/404 meetings, have received copies of minutes of those meetings, and have been apprised of the current status of this project.

4.2 Trustee Agencies under CEQA

The CDFG is considered a Trustee Agency (California Environmental Quality Act [CEQA] Guidelines Section 15386) because it has jurisdiction by law over natural resources that could be affected by the project that are held in trust for the people of the State of California. The CDFG has participated since the 2003 Notice of

Preparation and through participation in the NEPA/404 integration process in the development of this project.

4.3 Other Jurisdictional Agencies

Although not Responsible or Trustee agencies under CEQA, the following federal agencies are considered jurisdictional agencies because they will issue permits or approvals for the project:

- USACE
- USEPA
- USFWS

4.4 Notice of Preparation

A Notice of Preparation (NOP) was sent to the State Clearinghouse on February 2, 2003. A Notice of Preparation meeting was held March 6, 2003, at the Caltrans Venture Oaks office located in Sacramento. The purpose of this meeting was to solicit participation from responsible and trustee agencies to determine the scope of the Environmental Impact Report (EIR) for the project. Caltrans and CDFG were the only agencies in attendance. The following agencies responded in writing to the NOP. Their letters are included in Appendix K.

Comments were received from the Lake County Air Quality Management District, the United States Bureau of Land Management, USFWS, and the California Department of Toxic Substances Control, and are summarized in Table 4-1.

Table 4-1 Comments Received on the Notice of Preparation

Agency	Date	Issues/Concerns
Lake County Air Quality Management District	February 10, 2003	Possible impacts to air quality, especially particulate emissions.
United States Bureau of Land Management	March 3, 2003	Provided notification that no permits will be required as there are no Bureau of Land Management-administered lands within the project area.
United States Fish and Wildlife Service	March 12, 2003	Provided list of sensitive species that may occur in or near the project site and general guidelines for identifying and mitigating project impacts.
California Department of Toxic Substances Control	March 18, 2003	Provided list of known hazardous substances release sites near the project area.

4.5 Public Outreach

A public open house was held at Konocti Harbor Resort and Spa in Kelseyville on September 26, 2006. The purpose of the open house was to inform the public, local officials, and all interested parties of the current status of the project. The open house was announced by distributing public notices and invitations to approximately 240 addresses. Each addressee received an invitation and a copy of the public notice. The invitations were mailed to property owners, residents living within the project area, and other interested parties who requested to be notified of project activity. Notices were also mailed to tribal representatives and local, state, and federal officials and agencies. The open house was advertised in the local newspaper, the *Lake County Record-Bee*, and on local radio stations.

The format of the public open house was informal, and this format was chosen to facilitate communications between the public and Caltrans. Maps, exhibits, and graphic displays were set up around the room, with Caltrans representatives available to answer questions. Attendees were encouraged to submit written comments on cards that were provided for this purpose. Approximately 50 people, mostly property owners within the project area, attended the open house, and a total of nine people commented (with one person commenting twice). Six written comments were received at the meeting, two additional comments were received by mail following the meeting, and another two comments were published as “Reader’s Views” in the *Lake County Record-Bee* following the open house.

People chose to comment on a variety of topics. A summary of comment topics, as well as the number comments received on each topic, is presented below.

- General requests for information (2)
- Comments on the proposed design including the alternatives, suggested changes to the project limits, and concerns over access to properties (5)
- Concern about the potential for increased noise to residences (1)
- Support for the project (2)
- Comments about safety, including concerns about accidents within the project area as well as accidents on other segments of SR 29 (3)
- Concern about residential building construction occurring within the project limits (1)
- Comments not related to the project (1)

Caltrans also maintains a Lake 29 Improvement Project website at:
<http://www.dot.ca.gov/dist1/d1projects/lake29/>.

4.6 NEPA/404 Integration

In March 1994, USACE, USEPA, USFWS, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries), Federal Highway Administration (FHWA), Caltrans, and the Arizona and Nevada Departments of Transportation signed a formal Memorandum of Understanding (MOU) that integrated the NEPA process and the Clean Water Act Section 404 procedures, as well as improved coordination among stakeholder agencies. The NEPA/404 integration process was designed to implement Section 404 more effectively in its efforts to protect waters of the U.S., including wetlands, and the species of plants and animals that depend on this type of habitat.

In August 2000, prompted by a 1999 FHWA reorganization and changes in the USACE Nationwide Permit program, USACE, USEPA, USFWS, NOAA Fisheries, FHWA, and Caltrans ("Signatory Agencies") began working on a revised MOU, which was executed in April 2006. (The Arizona and Nevada Departments of Transportation did not participate in the new MOU.)

Under the old MOU, the integration process was required for any project that required FHWA or Federal Transit Administration action under NEPA and an individual permit from USACE. In 2000, additional interim thresholds were established, which required that the integration process be followed for any proposed federal-aid transportation projects in California that were likely to have impacts greater than 5 acres to special aquatic sites or impacts greater than 5 acres to other waters of the U.S. This project met the requirements of both the original MOU and the interim thresholds established in 2000. Under the new MOU, however, the integration process is only required for projects that are expected to have 5 acres of permanent impacts to waters of the U.S. and for which an Environmental Impact Statement (EIS) will be prepared. Under the new MOU, the integration process can be applied to other projects (such as those with less than 5 acres of impacts to waters of the U.S. or for which an Environmental Assessment [EA] will be prepared) if all of the Signatory Agencies agree.

Following the execution of the new MOU, it was decided that it would be beneficial to continue to use the integration process for this project, although it was no longer required.

Under the guidelines of the new MOU, the integration process consists of three checkpoints, which punctuate ongoing coordination efforts. These checkpoints are:

- Purpose and Need
- Identification of the range of alternatives to be studied in the draft EA or EIS, including the criteria used to select and analyze the range of alternatives to be studied
- Preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) and Conceptual Mitigation Plan

At each of these checkpoints, Caltrans sends the checkpoint item to the other Signatory Agencies for their “checkpoint response.” All Signatory Agencies may participate in the checkpoints, and the level of participation differs by agency and by checkpoint as described in Table 4-2.

Table 4-2 Signatory Agency Checkpoint Responses

Agency	Purpose and Need	Alternatives and Criteria	Preliminary LEDPA/ Conceptual Mitigation Plan
USACE	Agree/Disagree	Agree/Disagree	Concur/Nonconcur
USEPA	Agree/Disagree	Agree/Disagree	Agree/Disagree
USFWS	Comment	Agree/Disagree	Agree/Disagree
NMFS	Comment	Comment	Agree/Disagree

In March 2003, Caltrans and FHWA initiated the integration process for this project with CDFG, USACE, USEPA, and USFWS. Although not a Signatory Agency, CDFG has also been invited to participate in the NEPA/404 process for this project due to its role as a Trustee Agency. An initial NEPA/404 integration meeting was held on March 3, 2003, in Sacramento.

Following the development of Alternative D, the NEPA/404 integration process was re-initiated in June 2005. In July 2005, NOAA Fisheries stated that as the project is not likely to affect resources under its jurisdiction, it did not foresee any need to comment on documents in the future.

Between June 2005 and August 2006, four additional NEPA/404 meetings were held. The primary purpose of these meetings was twofold: to obtain “Comment” or “Agreement” (as applicable) on the purpose and need, range of alternatives, and criteria for the selection of project alternatives; and to develop strategies to avoid three endangered plant species located within the project area.

Caltrans submitted the first “Request for Checkpoint Response” to USACE, USEPA, and USFWS on June 30, 2006. After this submittal and at the request of the responding agencies, the project purpose and need and range of alternatives were revised to address outstanding concerns. A second “Request for Checkpoint Response” was submitted to USACE, USEPA, and USFWS on October 24, 2006. On November 6, 2006, USEPA provided its formal “Agreement” with the project purpose and need, range of alternatives, and criteria for the selection of project alternatives. On December 29, 2006, USACE provided its formal “Agreement” to these same items.

The USFWS did not provide comments on the project purpose and need, alternatives selection criteria, or range of alternatives. Checkpoint requests and responses are included in Appendix A.

As noted above, a primary goal of the NEPA/404 coordination meetings has been to develop strategies to avoid potential effects to Burke’s goldfields, few-flowered navarretia, and Lake County stonecrop—three endangered plants located within the project area.

Caltrans has, to date, made substantial efforts to avoid potential direct and indirect effects to these plant species. Upon initiation of the NEPA/404 process in March 2003, five alternatives were under consideration: Alternative A (No Build), Alternative B (Passing Lanes), Alternative C1 (four-lane expressway on the existing centerline), Alternative C2 (four-lane expressway shifted 30 feet to the north of the existing centerline), and Alternative C3 (four-lane expressway shifted 30 feet to the south of the existing centerline). In late 2003, following the completion of the initial environmental analysis, a new expressway alternative was developed that would minimize the environmental impacts of the project by avoiding known resources. The resulting Alternative D substantially reduced impacts to all environmental resources, including these endangered plant species.

Alternative D was presented to the NEPA/404 agencies at coordination meetings in June and December 2005. To address concerns regarding the remaining direct effects

to these plants, Caltrans shared a preliminary revised version of Alternative D with the NEPA/404 agencies at the August 16, 2006, coordination meeting. This version of Alternative D avoided all direct impacts to these plant species. The participating agencies raised additional concerns regarding potential indirect effects to these species resulting from their isolation between the existing and proposed roadways, as well as concerns that changes in hydrology in the project area could result in indirect effects to these species.

To address these outstanding concerns over potential indirect effects, Caltrans prepared another revision to Alternative D, which included substantial changes to the project alignment. Revisions were made at two primary locations along the project corridor where the endangered plants are known to occur, Manning Flat and the area surrounding the intersection of SR 29 and Konocti Camp Road. With these changes, Caltrans believes that Alternative D will not result in any direct or indirect effects to these species. Consequently, however, the revisions to Alternative D have resulted in increased impacts to other environmental resources including cultural resources and wetlands, increased disposal quantities, and increased project costs.

Despite the revisions to the alignment of Alternative D described above, concerns remain over potential indirect effects to these species. In order to address these concerns, Caltrans is undertaking further research and performing additional studies, the results of which will be included in the Biological Assessment that will be submitted to USFWS for this project as well as the final environmental document. These studies include an additional season of surveys for these plants within the project's Environmental Study Limits (ESL) and new surveys for these species in ten additional areas of suitable habitat along the project corridor (but outside of the ESL). The purpose of these surveys is to provide additional assurance that there are no additional, undiscovered populations of these plants within the ESL, and to provide USFWS with more information regarding the exact status of the distribution of these plants near the project area so that the potential effects of the project can be fully evaluated.

Caltrans will also, to the extent possible,³¹ survey known historical populations of these species elsewhere in Lake County.

In addition to performing additional surveys for these plant species, Caltrans will perform detailed hydrologic studies for limited areas within the project corridor (in areas where these species are known to occur or in areas of likely habitat) to develop a drainage design for the project that will ensure that existing surface flows are perpetuated after construction of the project.

Over the last several years Caltrans has expended a great deal of effort on the design and subsequent redesigns of this project to reduce impacts to sensitive environmental resources. The most recent revisions to the project have been made using the best scientific and commercial data available. Caltrans will continue to partner with USFWS and CDFG to avoid effects to Burke's goldfields, few-flowered navarretia, and Lake County stonecrop.

4.7 Lake 29 Technical Advisory Committee

Early in the planning states, a Technical Advisory Committee (TAC) was formed, composed of representatives from Caltrans, the California Highway Patrol, and various local agencies. The current Lake 29 TAC is composed of the following members:

- Dave Carstensen, Caltrans
- Richard Coel, Lake County Community Development Department
- Philip Dow, Consultant, Dow and Associates
- Bob Galusha, Interim Engineer, City of Clearlake
- Scott Harter, Engineer, City of Lakeport
- Lt. Dane Hayward, California Highway Patrol
- Irwin Kaplan, Community Development Director, City of Clearlake
- Richard Knoll, Lakeport Community Development Department
- Gerry Shaul, Lake County Director of Public Works
- Mark Wall, Transit Manager, Lake County Transit Authority

³¹ Surveys outside of the project area are subject to obtaining landowner permission. Due to the limited number of populations of these species within the project corridor, surveys of historical populations will provide much-needed comparative information (such as whether or not a particular species is in bloom yet) that will assist with the surveys and assessment of populations within the project corridor.

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- Gary Sweeten, FHWA

Caltrans Staff

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- Larry Brohman, Traffic Study/Transportation
- John Carson, Traffic Operations
- Chris Collison, Biology
- Ed Cramer, Designer
- Santa Finney, Project Analyst
- Jeff Haney, Project Archaeologist
- Jennifer Heichel, Project Environmental Coordinator
- Jim Hibbert, Landscape Architect
- Mike Holmes, Right of Way Engineering
- Steven Hughes, Design, Branch Chief
- Rex Jackman, Transportation Planning
- Wesley Johnson, Designer
- Jeremy Ketchum, Environmental Senior
- Elisa King, Designer
- Lucy Kostrzewa, Hydraulics Senior
- Valency Langtry, Designer
- Fernando Manzanera, Hydraulics
- Anmarie Medin, Historical Archaeologist
- Cherilyn Meigs, Biology
- Ralph Martinelli, Traffic Safety
- Aaron McKeon, Community Impacts Specialist
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- Kimberly Rudolph, Right of Way
- Erik Schwab, Project Biologist
- Gail St. John, Architectural Historian
- Sharon Tang, Air Quality Specialist
- Benjamin Tam, Noise Specialist

- William Walker, Right of Way
- Cheryl Willis, Deputy District Director, Transportation Planning
- Bruce Wilson, Right of Way Senior
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- Mike Yancheff, Project Manager

External Partners/Stakeholders

- Donald Arnold, Scotts Valley Band of Pomo
- Daniel Beltran, Lower Lake Rancheria Koi Nation
- Rob Brown, Lake County Board of Supervisors
- Gene Cooley, CDFG
- Lisa-Davey Bates, Lake County/City APC
- Holly Herod, USFWS
- Anthony Jack, Big Valley Rancheria of Pomo Indians
- Ross L. Kauper, Lake County Air Quality Management District
- Nancy Levin, USEPA
- David McCloud, Lower Lake Rancheria Koi Nation
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The following Caltrans staff and consultants contributed to the preparation of this EIR/EA.

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Chapter 6 Distribution List

The following agencies, organizations, and individuals will be sent a copy of this EIR/EA. A notice to availability of this document has been sent to a much broader list that includes all owners and occupants of property contiguous to the parcels on which the proposed project is located.

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