Olancha/Cartago Four-Lane Project

On U.S. Highway 395 in Inyo County
from 2.1 miles south of LA Aqueduct Bridge (#48-10)
to 0.2 mile south of Ash Creek Bridge (#48-11)
09-INY-395-PM 29.2/PM 41.8
Project ID 09-0000-0030
SCH# 2010091023

Technical Studies

List of Technical Studies

Air Quality Report, February 2010
Air Quality Report Addendum, May 2010
Air Quality Report Addendum, April 2015
Noise Study Report, July 2003
Noise Study Report Addendum, August 2008
Noise Study Report Addendum, August 2010
Water Quality Report, August 2008
Water Quality Report Addendum, March 2010
Natural Environment Study, 2003
Natural Environment Study Addendum, 2010
Natural Environment Study Addendum, October 2014
Location Hydraulic Study / Floodplain Evaluation, December 2000
Addendum to the Location Hydraulic Study / Floodplain Evaluation, January 2007
Preliminary Geotechnical Report, December 1999
Preliminary Geotechnical Report Errata, May 2010
Historic Property Survey Report, March 2004
Supplemental Historic Property Survey Report, January 2010
Initial Site Assessment for Hazardous Waste, September 2003
Addendum for the Initial Site Assessment for Hazardous Waste, January 2007
Addendum for the Initial Site Assessment for Hazardous Waste, June 2009
Addendum for the Initial Site Assessment for Hazardous Waste, March 2010
Addendum for the Initial Site Assessment for Hazardous Waste, December 2014
Visual Impact Assessment, January 2010
Visual Impact Assessment Addendum, July 2014
Relocation Impact Statement, October 2013
Paleontological Identification Report, March 2010
Paleontological Evaluation Report, April 2014
Traffic Operations Report, January 2010
Traffic Operations Report, December 2013

Air Quality Report and Addendums

Air Quality Study Report

OLANCHA CARTAGO FOUR-LANE

State Route 395/INYO County
District 09-INYO 395-PM 29.2/41.8
EA-09-213400

Prepared by the
State of California Department of Transportation

Feb 2010

Caltrans

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Air Quality Study Report

Olancha Cartago Four-Lane

District- 09-INYO-395-PM 29.2/41.8

EA-09-213400

Feb 2010

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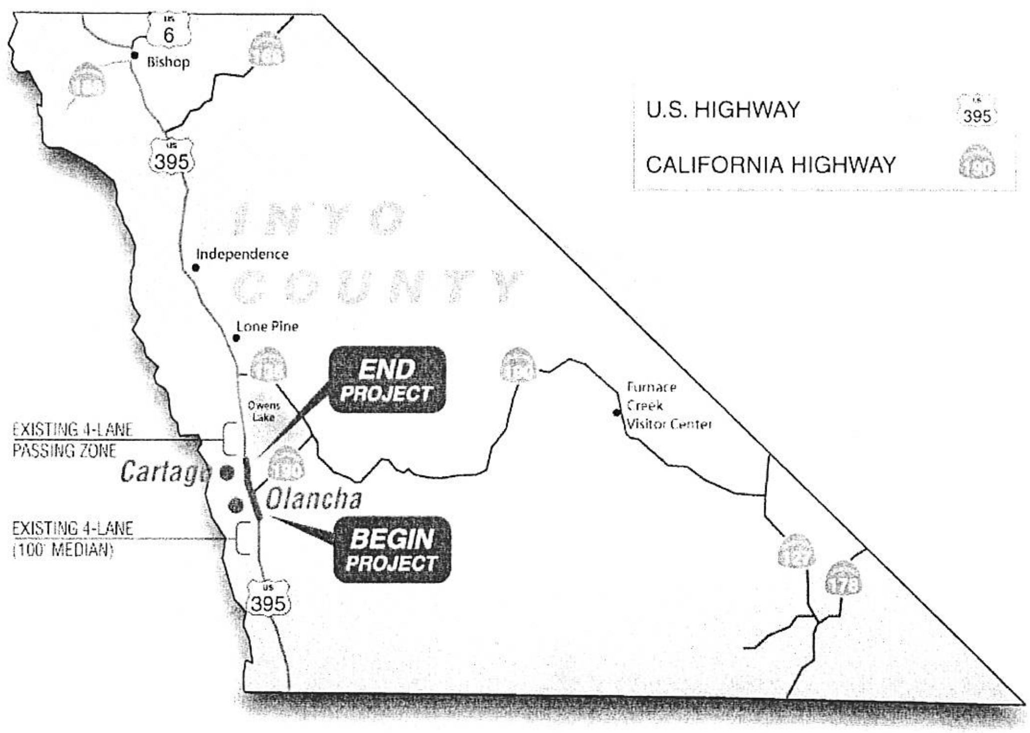
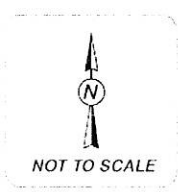
Project Vicinity Map





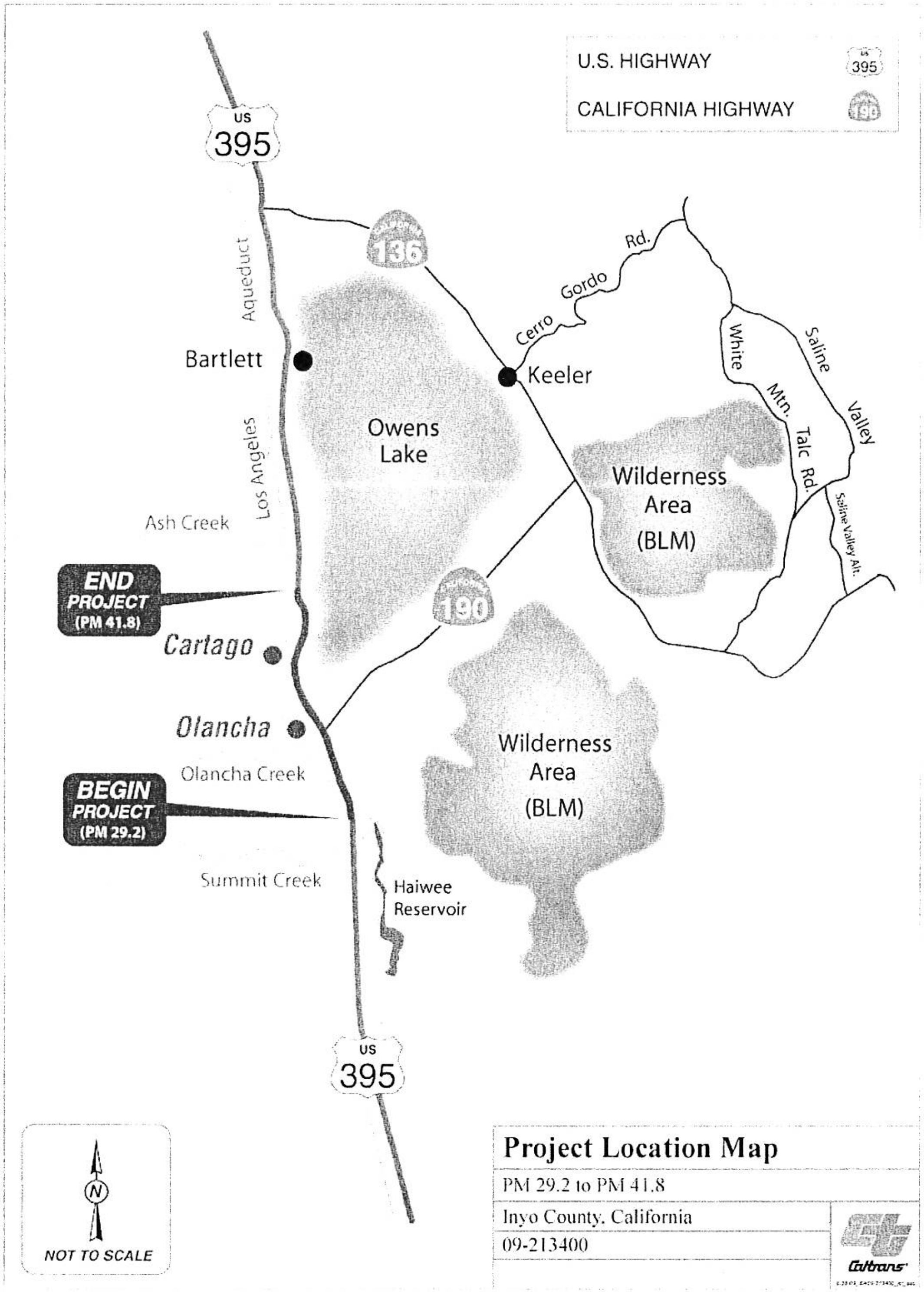
Project Vicinity Map

PM 29.2 to PM 41.8

Inyo County, California

09-213400

Caltrans


U.S. HIGHWAY
CALIFORNIA HIGHWAY
US 395
136
190
Aqueduct
Los Angeles
Bartlett
Keeler
Cerro Gordo Rd.
White Mtn. Talc Rd.
Saline Valley
Saline Valley Alt.
Owens Lake
Wilderness Area (BLM)
Ash Creek
END PROJECT (PM 41.8)
Cartago
Olancha
Olancha Creek
BEGIN PROJECT (PM 29.2)
Summit Creek
Haiwee Reservoir
Wilderness Area (BLM)
US 395
N
NOT TO SCALE
Project Location Map
PM 29.2 to PM 41.8
Inyo County, California
09-213400
Caltrans

Executive Summary

This air study provides a discussion of the proposed project, the physical setting of the project area, and the regulatory framework for air quality. The report provides data on existing air quality, evaluates potential air quality impacts associated with the proposed project, and identifies mitigation measures recommended for potentially significant impacts.

The California Department of Transportation (Caltrans) proposes to upgrade the existing two-lane conventional highway to a four-lane expressway. Five build alternatives and no-build alternative is currently under consideration.

The proposed project is located in Inyo County, which is maintenance area for federal particulate matter (PM10) standards. A qualitative "hot-spot" analysis for PM10 was conducted and has been submitted to Interagency Consultation as "not a Project of Air Quality Concern (POAQC)."

Inyo County is in federal attainment area for carbon monoxide. Historical air quality data show that existing carbon monoxide levels for the project area and the general vicinity do not exceed either the state or federal ambient air quality standards.

The Federal Highway Administration issued interim guidance on February 3, 2006 for Mobile Source Air Toxics (MSAT) analysis in National Environmental Policy Act documents. There are no air monitors that monitor these pollutants. Currently, available technical tools do not enable us to predict the project-specific health impacts; therefore only a qualitative analysis was conducted.

Inyo County is not among the counties listed as containing serpentine and ultramafic rock. Impacts from naturally occurring asbestos (NOA) during project construction would be minimal to none.

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1. Purpose of Air Quality Study Report

This report documents the anticipated air quality effects of the proposed project. Because this document is intended to satisfy the requirements of both the California Environmental Quality Act and the National Environmental Policy Act, it addresses both state and federal air quality standards.

This report documents the anticipated air quality effects of the proposed project. Because this document is intended to satisfy the requirements of both the California Environmental Quality Act and the National Environmental Policy Act, it addresses both state and federal air quality standards.

2. Project Location, Description, and Alternatives

The California Department of Transportation and the Federal Highway Administration proposes to convert approximately 12.6 miles of the existing two-lane conventional highway into a four-lane expressway or partial conventional four-lane highway from post miles 29.2 to 41.8 in Inyo County. The project proposes 5 alternatives with some on new alignments. Portions of the existing road may be used as part of the proposed alternatives, relinquished to the county, or removed. The new facility would have four 12-foot lanes and a variable median width. There will be 5-foot inside and 10-foot outside paved shoulders throughout the project. This project also proposes constructing new concrete bridges to cross the Los Angeles Aqueduct, and installing concrete box culverts and smaller pipe culverts throughout the project limits to promote drainage. Depending on the alternative selected, this project proposes to extend State Route 190 to intersect with the proposed improvements. A borrow site at the end of Fall Road and south of Olancha Creek would be used to provide soil and road materials for the project.

Alternatives: Five build alternatives and the "no-build" alternative are proposed for evaluation and study, and may include slight variations. Briefly, these are described as follows:

Alternative 1:

This alternative proposes constructing segments of conventional all-paved, conventional divided, and controlled access four-lane divided highway. The project will provide for facility continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

South End of the Project – Sage Flat Four Lane (0.45 miles south of LA Aqueduct Bridge #48-10 PM 30.8)
Controlled access four-lane divided highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west separated by a 100 ft. median. This segment is the same for alternatives 1 thru 3.

0.6 Miles south of Cactus Flat Road (PM 32.1)
Conventional all-paved four-lane highway is proposed. The existing highway will be widened with northbound and southbound lanes separated by a 14 foot paved median.
1 mile north of the State Route 190 junction (PM 35.7)
Conventional divided four-lane highway is proposed. The existing highway will be widened to the west with northbound and southbound lanes separated by a 100 ft. unpaved median. An at-grade crossing, acceleration, and deceleration lanes will be provided to truck traffic at the bottling plant. Access control will be purchased along the western right-of-way.

0.5 miles south of Whitney Street (PM 37.2)
Conventional four-lane highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west separated by a 14-foot paved median.

0.6 miles north of Whitney Street (PM 38.4)
Controlled access four-lane divided highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the east separated by at least a 100 ft. median. Lanes will be constructed to avoid existing steel transmission line towers.

2.2 miles north of Whitney Street (PM 40.0)
Controlled access four-lane divided expressway is proposed. The existing lanes will be used for southbound traffic, and new northbound lanes will be constructed to the east separated by at least a 100-ft. median.

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) (PM 41.8)
Olancha and Cartago consist primarily of residential units. Olancha is situated mostly west of 395 and Cartago is mostly east of existing 395. Cartago has a honey warehouse and a water bottling plant just south of the community. Improvements exist on both sides of the current alignment and both communities will have to relinquish private land to widen the right-of-way.

This alternate will affect the Ranch House Café, which offers little clearance for the widening of four lanes centered on the existing alignment. Construction of the new segment symmetrically about the existing centerline would place the edge of the pavement within 16 feet of the Ranch House Café. Currently, trucks park off the roadway within the unpaved shoulder area. Parking will be greatly affected for the trucks if Alternative 1 is selected.

Alternative 2:

This alternative proposes construction of a controlled access four-lane divided expressway with the northbound and southbound lanes separated by at least a 100 ft. wide median throughout the project. The project will provide for facility continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

South End of the Project – Sage Flat Four Lane (0.45 miles south of LA Aqueduct Bridge #48-10) (PM 30.8)
Same as alternative 1

1.1 miles south of Cactus Flat Road (PM 31.6)
New northbound and southbound lanes will be constructed to the east of the existing highway, and the existing highway will be relinquished to Inyo County.

0.2 miles south of the Junction of State Route 190 (PM 34.5)
New northbound and southbound lanes will be constructed to the west of the existing highway. The existing highway will be relinquished to Inyo County.

0.5 miles south of Whitney Street (PM 37.2)
Existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west.

0.6 miles north of Whitney Street (PM 38.4)
Same as alternative 1

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) PM 41.8

Alternative 2A:

This alternative is a variation of Alternative 2, and proposes that the controlled access divided four-lane expressway be constructed to the west of the community of Cartago with the northbound and southbound lanes separated by at least a 100 ft. wide median throughout.

South End of the Project – Sage Flat Four Lane (0.45 miles south of LA Aqueduct Bridge #48-10 PM 30.8)
Same as Alternative 2.

0.8 mile north of the State Route 190 junction (PM 35.5)
Proposed that the new northbound and southbound lanes be constructed to the west of the community of Cartago.

0.8 miles north of Whitney Street (PM 38.6)
Similar to Alternative 1.

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) PM 41.8

Alternative 3:

This alternative proposes construction of a controlled access divided four-lane expressway to the west of the community of Olancha with the northbound and southbound lanes separated by at least a 100 ft. wide median throughout the project. The project will provide for facility continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north. Throughout the project inside shoulder width will be 5 feet and outside will be 10 feet.

South End of the Project – Sage Flat Four Lane (0.45 miles south of LA Aqueduct Bridge #48-10 PM 30.8)
Same as Alternative 1.

0.5 Miles south of Cactus Flat Road (PM 32.2)
New northbound and southbound lanes are proposed to be constructed to the west of the community of Olancha, near the L. A. Aqueduct. The junction with State Route 190 will be extended to the west to connect with the new lanes. A CTC approved Route Redesignation is required if the terminus of SR 190 is altered by Alt 3. (PDPM Chapter 23, Article 7)

0.6 miles south of Whitney Street (PM 37.2)
Same as alternative 2

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) PM 41.8

Alternative 4:

South End of the Project – Sage Flat Four Lane (1.5 miles south of LA Aqueduct Bridge #48-10 PM 29.75)
Alignment 4 will be a new alignment west of the LA Aqueduct. A 4 lane divided expressway with a 100 foot median will be constructed from PM 29.75 to the northern limit of Cartago. North of Cartago the median will be 100 feet or wider so as to thread existing utilities. Land necessary for right-of-way is almost entirely Agency land (BLM, Forest service, LADWP). Access will be controlled by a right-of-way fence. The new road will bear west of the current alignment near PM 29.75 and tie in approximately with the old railroad grade. The road will continue north along the west side of the LA aqueduct. At a point just west of Cartago the road will bridge the aqueduct and angle back toward the current alignment. North of PM 38.6 alternative 4 will become similar to the other alternatives. Access control will be purchased and the route will be designated Expressway. This is a new alignment and will require adoption by the CTC. The new alignment will be denominated as "Controlled Access Highway" by a "Controlled Access Highway Agreement".

All of the existing U.S. 395 within the project construction area may be relinquished to Inyo County or some of it may become part of SR 190. A CTC approved Route Redesignation is required if the terminus of SR 190 is altered by the selection of Alt 3 or Alt 4.

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) PM 41.8

No-Build Alternative

The No-Build Alternative will maintain the current non-standard features and safety concerns that currently exist and would not address the purpose and need for this project.

The impact of this project on air quality is described below.

3. Federal, State, and Local Regulations

The primary legislation that governs federal air quality regulations is the Clean Air Act Amendments of 1990 (CAAA). The CAAA delegates primary responsibility for clean air to the U.S. Environmental Protection Agency (EPA). The EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies. Under the Clean Air Act, the EPA has established the National Ambient Air Quality Standards (NAAQS) for six potential air pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), suspended particulate matter (PM_{10} & $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb).

The State of California has developed the California Ambient Air Quality Standards (CAAQS). The Air Resources Board (ARB), which is part of the California EPA regulatory agency, develops air quality regulations at the state level. The state regulations mirror federal regulations by establishing industry-specific pollution controls for criteria, toxic, and nuisance pollutants. California also requires that plans and strategies for attaining state ambient air quality standards as set forth in the California Clean Air Act of 1988 be developed throughout the state. The ARB also is responsible for developing motor emissions standards for California vehicles.

The project is located in the Great Basin Valleys Control District, which administers air quality regulations developed at the federal, state, and local levels. These regulations are described below.

4. Air Quality Pollutants and Standards

As stated, the federal and state governments have established ambient air quality standards for six criteria pollutants: carbon monoxide (CO), ozone (O_3), particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). Ozone and PM are generally considered to be regional pollutants because they or their precursors affect air quality on a regional scale. Pollutants such as CO, NO_2, SO_2, and Pb are considered to be local pollutants because they tend to accumulate in the air locally. PM is also considered as a local pollutant. In the area of the proposed project site ozone, PM_{10}, $PM_{2.5}$, and Carbon Monoxide are of particular concern.

A. **Carbon Monoxide (CO)**: Carbon Monoxide is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea to death. State and federal CO standards have been set for both 1-hour and

8-hour averaging times. The state 1-hour standard is 20 parts per million (ppm) by volume, and the federal 1-hour is 35ppm. Both the state and federal standards are 9ppm for the 8-hour averaging period. Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light wind combine with ground-level temperature inversions. These conditions result in reduced dispersion of vehicle emissions. In addition, motor vehicles emit more CO in cool temperatures than in warm temperatures.

B. **Ozone (O_3):** Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include oxides of nitrogen and reactive organic gases, react in the atmosphere in the presence of sunlight to form ozone. State and federal standards for ozone have been set for a 1-hour averaging time. The state requires that ozone concentration not exceed .09ppm of ozone being produced in a given area in 1 hour. The federal 1-hour ozone standard is .12ppm, but it does not apply in California. The federal 8-hour ozone standard is .08ppm and the state standard is .07ppm.

C. **Particulate Matter (PM_{10}) & ($PM_{2.5}$)**: Particulate matter emissions are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic and construction equipment, and secondary aerosols formed by reactions in the atmosphere. The NAAQS for particulate matter applies to two classes of particulate: particulate matter 2.5 microns or less in diameter ($PM_{2.5}$) and particulate matter 10 microns or less in diameter (PM_{10}).

D. **Nitrogen Dioxide (NO_2):** Nitrogen dioxide belongs to a family of highly reactive gases called nitrogen oxides (NOx). These gases form when fuel is burned at high temperatures, and come principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers. A suffocating, brownish gas, nitrogen dioxide is a strong oxidizing agent that reacts in air to form corrosive nitric acid, as well as toxic organic nitrates. It also plays a major role in the atmospheric reactions that produce ground-level ozone (or smog). EPA's health-based national air quality standard for nitrogen dioxide is .053ppm.

E. **Sulfur Dioxide (SO_2):** Sulfur dioxide belongs to the family of sulfur oxide gases (SOx). These gases are formed when fuel containing sulfur (mainly coal and oil) is burned, and during metal smelting and other industrial processes. EPA's health-based national air quality standard for sulfur dioxide is .030ppm (measured on an annual average) and .14ppm (measured over 24 hours).

F. **Lead (Pb):** Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been motor vehicles and industrial sources. Due to the phase out of leaded gasoline, metal processing is the major source of lead emissions to the air today. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Other Pollutants:

Mobile Source Air Toxics (MSATs): These toxics are a subset of the 188 air toxics defined in the Clean Air Act. They are now federally regulated under 40 Code of Federal Regulations 1502.22 by the U.S. Environmental Protection Agency. Mobile source air toxics are 21 compounds emitted from highway vehicles and non-road equipment. There are six main toxics including diesel exhaust, benzene, and formaldehyde. The Federal Highway Administration issued interim guidance on February 3, 2006 for analysis in National Environmental Policy Act documents. Currently, available technical tools do not enable us to predict the project-specific health impacts, so only a qualitative analysis is conducted.

Table 1 Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	State Standards (CAAQS)	Federal Standards (NAAQS)
Ozone	8 hour	.07 ppm (137 µg/m^3)	.08 ppm (157 µg/m^3)
	1 hour	.09 ppm (180 µg/m^3)	NA
Carbon Monoxide	8 hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
Nitrogen Dioxide	Annual arithmetic mean	NA	0.053 ppm (100 µg/m^3)
	1 hour	0.25 ppm (470 µg/m^3)	NA
Sulfur Dioxide	Annual arithmetic mean	NA	.03 ppm (80 µg/m^3)
	24 hour	.04 ppm (105 µg/m^3)	.14 ppm (365 µg/m^3)
	1 hour	.25 ppm (655 µg/m^3)	NA
Particulate Matter (PM_{10})	Annual arithmetic mean	20 µg/m^3	NA
	24 hour	50 µg/m^3	150 µg/m^3
Particulate Matter – fine ($PM_{2.5}$)	Annual arithmetic mean	12 µg/m^3	15 µg/m^3
	24 hour	No separate state standard	35 µg/m^3
Sulfates	24 hour	25 µg/m^3	NA
Lead	Calendar quarter	NA	1.5 µg/m^3
	30-day average	1.5 µg/m^3	NA
Hydrogen Sulfide	1 hour	.03 ppm (42 µg/m^3)	NA
Vinyl Chloride (Chloroethene)	24 hour	.01 ppm (26 µg/m^3)	NA
Visibility-Reducing Particles	8 hour (10:00 a.m. to 6:00 p.m. Pacific Standard Time)	Extinction coefficient of 0.23 kilometer—visibility of 10 miles or more due to particles when relative humidity is less than 70 percent.	NA

Source: California Air Resources Board (11/10/06) and Environmental Protection Agency (10/13/06) mg/m3=milligrams per cubic meter; NA=no standard implemented; ppm=part per million; µg/m3=micrograms per cubic meter

5. Air Quality Conformity

The 1990 Federal Clean Air Act Amendments (CAAA), enacted on November 15, 1990, placed tough new requirements on sources and causes of air pollution in areas failing to meet federal air quality standards. The CAAA require substantial reduction from all pollution sources, including pollutants from the transportation sector. The CAAA included more stringent requirements for demonstrating that transportation plans and projects contributed to improvement in air quality contained in the conformity provisions in section 176(a). On Nov 15, 1993, the EPA published a conformity rule delineating specific criteria and procedures for fulfilling the conformity requirements of the CAAA. This rule was recently updated and published in the Federal Register August 15, 1997. It became effective September 15, 1997.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) made a number of revisions to the Clean Air Act's transportation conformity provisions. In particular, SAFETEA-LU made the following changes:

1. Changes 18-month trigger to two years for redetermination of conformity after certain air quality planning actions.
2. Changes frequency of conformity for plans and Transportation Improvement Programs (TIPs) from every 3 years to every 4 years.
3. Provides option for Metropolitan Planning Organizations (MPOs) to shorten the time horizon for conformity determination.
4. Allows Transportation Conformity Measures (TCMs) to be substituted or to be added to existing TCMs without a State Implementation Plan (SIP) mechanism.
5. Provides a 12-month grace period before a lapse occurs after an applicable deadline is missed.
6. Limits Conformity SIPs to interagency consultation and enforcement provisions.

SAFETEA-LU requires EPA to revise the Transportation Conformity Rule by August 10, 2007, two years after the enactment of SAFETEA-LU.

6. Transportation Conformity

The federal Clean Air Act requires that all transportation plans and programs pass the air quality conformity test. This process involves forecasting future emissions of air pollution to determine whether the amount of future pollution resulting from the plan or program would be within the allowable limit for motor vehicle emissions.

Transportation conformity must be determined for all nonattainment area pollutants classified as regional pollutants. In the Great Basin Valleys Air Basin, those pollutants are Ozone, PM_{10} and $PM_{2.5}$. Transportation projects also generate CO, which is considered a localized pollutant. CO micro-scale modeling is required to determine whether a transportation project would cause or contribute to localized violations of CO NAAQS.

Regional conformity must be determined based on a full study at least every 3 years. In California, it is determined at least every two years when the state-required Regional Transportation Plan (RTP) updates are done. In addition, a new federal TIP is required every four years, for which a conformity determination is required. Amendments to both the RTP and TIP between mandated conformity analysis also must have conformity demonstrated, including a full-scale revision of the regional analysis if regionally significant projects are added, deleted, or significantly modified.

Regional conformity is demonstrated by showing that the project is included in a conforming RTP and TIP with, substantially, the same design concept and scope that was used for the regional conformity analysis.

Project level conformity is demonstrated by showing that it will not cause a localized exceedance of CO and/or PM_{10} standards, and that it will not interfere with "timely implementation" of Transportation Control Measures called out in the State Implementation Plan.

The Final Rule has the following Key Elements:

- This rule requires that $PM_{2.5}$ hot spot analyses be performed only for new transportation projects with significant diesel traffic. Examples of such "projects of air quality concern" include intermodal freight or bus terminals, and major highway projects and congested intersections involving significant diesel traffic. No hot spot analyses will be required for most projects in $PM_{2.5}$ areas, because most projects are not an air quality concern. This final rule also streamlines existing PM_{10} hot spot requirements in a similar way.
- The streamlined approach in this final rule will ensure that transportation and air quality agencies in $PM_{2.5}$ and PM_{10} areas use their resources efficiently, while achieving clean air goals.
- In both $PM_{2.5}$ and PM_{10} areas, a quantitative hot spot analysis is not required until EPA issues a new motor vehicles emissions model capable of estimating local

emissions as well as future hot spot modeling guidance. Qualitative analyses will apply in the interim.

- This rule extends an existing flexibility by allowing the U.S. Department of Transportation to make "categorical hot spot findings," which waive $PM_{2.5}$ and PM_{10} hot spot reviews for categories of projects where modeling shows that there is no air quality concern.

7. Regional Climate and Topography

Encompassing more than 10,000 square miles, Inyo County features an unparalleled variety of natural wonders and stunning vistas, recreational opportunities, cultural amenities, and rich native, pioneer, mining, movie making and water histories. The County includes: Mount Whitney, the highest peak in the lower 48 states; Death Valley National Park, which features the lowest point of elevation (Badwater) in the United States; and, the Great Basin Bristlecone Pines, the oldest life forms in the world. The Palisade Glacier, which is accessed through Big Pine, is the southernmost glacier in the Northern Hemisphere. The unique features of Alabama Hills, located just outside of Lone pine on the road to Whitney Portal, have set the stage for over 400 firms, and continue to enchant visitors and movie producers from around the world.

In the west, Highway 395 transects the Owens Valley, paralleling the majestic Eastern Crest of the High Sierra, where it passes through the towns of Lone Pine, Independence, and Big Pine, and the City of Bishop, while connecting San Diego and the Los Angeles basin to Mammoth Mountain ski resort.

In the Southeast area of the County, the communities of Shoshone and Tecopa provide a gateway to Death Valley National Park from Las Vegas.

8. Emissions Analyses

The nearest air quality monitoring stations are located in Olancha-walker Creek Road (PM10 and PM2.5) and Death Valley National Monument (Ozone). There is no data for carbon monoxide at any monitoring station in the project area.

Table 2 Conformity

Pollutant	Federal Conformity	State Conformity
O_3 8-hour	Attainment	Nonattainment
O_3 1-hour	Attainment	Nonattainment
CO	Attainment/Unclassified	Attainment/Unclassified
PM_{10}	Attainment/maintenance	Nonattainment
$PM_{2.5}$	Attainment	Attainment
SO_2	Attainment/Unclassified	Attainment
NO_2	Attainment/Unclassified	Attainment
H_2S	Attainment/Unclassified	Unclassified

Source: ARB ADAM Site Summaries

A. Regional Analysis

The project is not exempt from conformity under 40 CFR 93.126. The project is included in Inyo County RTP and TIP (Adopted on April 22, 2009), and conforms to the Great Basin Unified Air Pollution Control District State Implementation Plan (SIP) approved in 1998.

The county is an attainment area for state and federal PM10 standards except for two areas: the Owens and Searles Valleys. The Owens and Searles Valleys are nonattainment areas because of windblown dust from exposed areas of Owens dry lake. The Great Basin Unified Air Pollution Control District has prepared a state implementation plan for PM10 that includes mitigation measures designed to minimize windblown dust from Owens dry lake. The plan does not include any measures to reduce PM10 from paved or unpaved roads because roads are not considered a significant contributor to Inyo County's existing PM10 problem.

Transportation conformity requirements, contained in the Great Basin Unified Air Pollution Control District Regulation XII require that federal actions and federally funded projects conform to SIP rules and that they do not interfere with efforts to attain federal air quality standards. The emissions inventory shows very low PM10 emissions from mobile sources and transportation-related activities in the Planning Area. However, fugitive dust from construction-related activities in areas along

Highway 395 have caused significant dust events in the Planning Area. For transportation conformity purposes, PM10 emissions from construction-related activities will be quantified as required by Great Basin Unified Air Pollution Control District Rule 1231(e) for any new highway construction projects in the OVPA, and will be subject to District Rules 400 and 401 for controlling fugitive dust.

B. Project Level Analysis

1. Carbon Monoxide:

This Project is located in an attainment/unclassified area for the federal carbon monoxide standard.

The flow chart in Caltrans' Transportation project Level Carbon Monoxide Protocol for local analysis was used to determine the CO impacts. Since the project is located in attainment/unclassified area, the protocol indicated that the user proceed to Level7 in Figure 3 of the protocol. Three questions must be satisfied:

a) Does the project increase the number of vehicles operating in cold start mode by as little as 2%? No.

b) Does the project increase traffic volumes in excess of 5%? No

c) Does the project worsen traffic flow? No.

Therefore, based on the above analysis no significant local impacts would occur as a result of the proposed project.
There is no reason to believe that the project will create a new violation or worsen an existing one.

Therefore, no mitigation measures are needed.

2. Particulate Matter:

Particulate matter (PM) Hot Spot analysis is required for projects in areas that are in non-attainment or maintenance of national ambient air quality standards for particulate matter in size of PM_{10} to $PM_{2.5}$.

Since Inyo County is an attainment area for PM2.5, no hot spot analysis is needed.

PM_{10} - The project is located in an attainment/maintenance area for PM_{10}. The nearest PM_{10} monitoring station is located on Olancha-Walker Creek Road. There are five violations of the Federal Standard at this site since 2006.

Table 3 National PM10 Standards and Exceedances

PM10	2006	2007	2008
Annual Average	21.0 μg/m3	21.7 μg/m3	22.3 μg/m3
3-Year Average	21 μg/m3	20 μg/m3	22 μg/m3
Days > Standard	0	0	5

This project will not contribute to a PM_{10} hot spot that will cause or contribute to violation of the PM_{10} National Ambient Air Quality Standards (NAAQS).

The annual average daily traffic (AADT) volume for the horizon year 2035 is well below the threshold for a "Project of Air Quality Concern" (POAQC) of 125,000 vehicles.

Table 4 Average Annual Daily Traffic Volume

Year	AADT	Truck Percentage (8.7%)
2005	6,300	548
2022	7,460	649
2032	8,240	717

Source: Caltrans Traffic Department

Caltrans has completed this PM_{10} assessment and has determined that this project is not a "Project of Air Quality Concern", therefore no further analysis is required.

<u>**Mobile Source Air Toxics**</u>

FHWA has issued interim guidance on how mobile source air toxics (MSATs) should be addressed in NEPA documents for highway projects. FHWA has developed a tier approach for analyzing MSATs in NEPA documents. Depending on the specific project circumstances, FHWA has identified three levels of analysis:

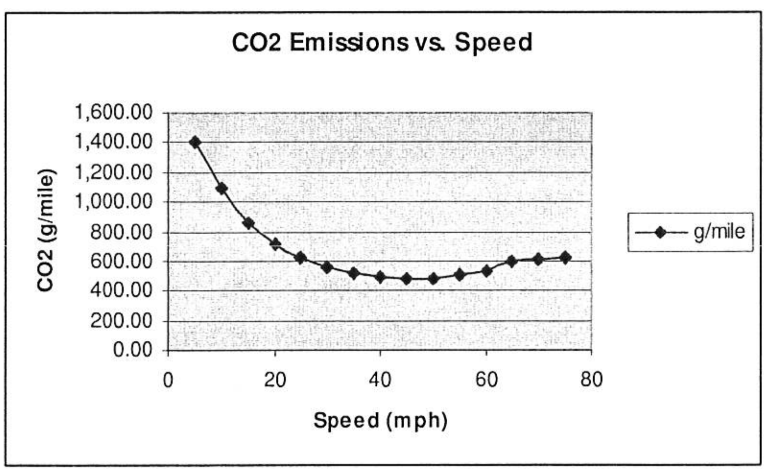
1. No analysis for exempt projects with no potential for meaningful MSAT effects
2. Qualitative analysis for projects with low potential MSAT effects
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT

The Olancha Cartago-4-Lane Expressway project has low potential for MSAT effects. The VMT estimated for each of the Build Alternatives is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Because the estimated VMT for each of the Alternatives are nearly the same, there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of the EPA'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 EPA-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.

Climate Change

One of the main strategies in the Department's Climate Action Program 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 (0-25 miles per hour) and speeds over 55 mph; the most severe emissions occur from 0-25 miles per hour.



Quantitative Analysis

Greenhouse gas emissions analysis and forecasting are relatively a new science using Existing modeling tools that were not originally designed for modeling greenhouse gases.
Estimated annual Carbon dioxide emissions were modeled using CT-EMFAC 2007. The Average Daily Traffic was the same for built and no build. The assumptions used in the model assume a peak hour (two hours per day) prevailing speeds of 5-45 miles per hour and the non-peak hour prevailing free flow speed was 35-60 miles per hour for the No-build Alternative. For the Build Alternative, the peak hour speed assumption was 40-45 and the non-peak hour speed assumption was 35-55.

The results in Table 5 indicate only a rough estimate of emissions based on projected annual average daily traffic data.

Table 5. Estimated Carbon Dioxide Emissions in Tons Per Year

Volume	2005	2022 Build	2022 No Build	2032 Build	2032 No-Build
CO2	987.8	1,069	1,072	1,097	1.127

Source: Caltrans Central Environmental Engineering Branch.

Accoring to EMFAC modeling results, both the Build and No-Build alternatives would result in more greenhouse gasses than the existing conditions. This is primarly because of EMFAC'S focus on predicted traffic volumes and speeds, which would increase with the addition of more lanes and vehicles the project adds to the highway. The Build Alternative is predicted to cause less Carbon dioxide than the No-Build Alternative.

The proposed project would improve traffic operations and reduce delay under build alternatives, compared to the No build alternative. Therefore, it is anticipated that the project would provide reduced GHG emissions compared to the No Build alternative.

9. Short-Term Construction Impacts

During construction, the proposed project will generate air pollutants. The exhaust from construction equipment contains hydrocarbons, oxides of nitrogen, carbon monoxide, suspended particulate matter, and odors. However, the largest percentage of pollutants would be windblown dust generated during excavation, grading, hauling, and various other activities. The impacts of these activities would vary each day as construction progresses. Dust and odors at some residences very close to the right of way could probably cause occasional annoyance and complaints.

Sources of short-term emissions from this project would include emissions generated by construction equipment, dust generated by grading and earthmoving operations, and dust generated by travel to and from the construction site.

Inyo County is not among the counties listed as containing serpentine and ultramafic rock (Governor's Office of Planning and Research, October 26, 2000). Therefore, the impact from Naturally Occurring Asbestos (NOA) during project construction would be minimal to none. If structures that may contain asbestos are to be demolished, it is the responsibility of the contractor to comply with the Rules and Regulations of the Air Pollution Control District.

10. Avoidance, Minimization, and/or Mitigation Measures

Caltrans Standard Specifications pertaining to dust control and dust palliative requirement is a required part of all construction contracts and should effectively reduce and control emission impacts during construction. The provision of Caltrans Standard Specifications, Section 7-1.0F "Air Pollution Control" and Section 10"Dust Control" require the contractor to comply with local Air District rules, ordinances, and regulations.

11. References

Aerometric Data Analysis and Management (ADAM), California Air Resources Board website: http://www.arb.ca.gov/adam/php_files/aqdphp/sc8start.php.

California Department of Transportation, 1997. Transportation Project Level Carbon Monoxide Protocol, Revised December 1997 (UCD-ITS-RR-97-21)

California Department of Transporatation. Procedures for PM Hot Spot Analysis.

Memorandum

To: Mathew Palmer
Associate Environmental Planner
Central Sierra Analysis Branch

Date: May 12, 2010

File: EA 09-213400
Inyo-395
PM 29.2/41.8

From: Abdulrahim N. Chafi

Subject: Updates to Air Quality Study

Objective

This memo is to serve as a notice that the findings in the attached study will not change with this modified project description below. Furthermore this memo will provide clarifying information with regards to Mobile Source Air Toxics, climate, topography, and identification of the local air district. None of this information will change the information and findings of the Air Quality Study dated February 2010.

Project Description

The California Department of Transportation (Caltrans), as CEQA lead agency, and the Federal Highway Administration, as NEPA lead agency, propose to convert approximately 12.6 miles of the existing U.S. Highway 395 from a two-lane conventional highway into a four-lane expressway or partial conventional four-lane highway from post mile 29.2 to post mile 41.8 in Inyo County. The project proposes five alternatives with varying amounts of construction on new alignments. The new facility would have four 12-foot lanes with a median of variable width. There would be paved shoulders throughout the project, five feet wide on the inside and ten feet wide on the outside. This project also proposes constructing new concrete bridges to cross the Los Angeles Aqueduct, and installing concrete box culverts and smaller pipe culverts throughout the project limits to promote drainage. Under some of the proposed alternatives, this project may extend State Route 190 to intersect with the proposed improvements. A borrow site at the end of Fall Road and south of Olancha Creek would be used to provide soil and road materials for the project.

Alternative 1

This alternative proposes constructing segments of conventional all-paved, conventional divided and controlled access four-lane divided highway. The new facility would follow the existing highway alignment, with the existing lanes being incorporated into the new facility. While this alternative would not bring the entire project up to expressway standards, it would still provide a facility meeting the concept facility of four-lanes in Inyo County.

The proposed segments of this alternative are as follows:

- Begin Work – 0.45 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.8) Four-lane divided expressway. The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 0.5 miles south of Cactus Flat Road (PM 32.1) Four-lane all-paved highway. The existing highway will be widened asymmetrically to the east.

- 0.1 miles south of SR 190 junction (PM 34.6) Four-lane all-paved highway. The existing highway will be widened asymmetrically to the west.

- 0.9 miles north of SR 190 junction (PM 35.6) Four-lane divided expressway. The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 0.3 miles south of Lake Street (PM 37.3) Four-lane all-paved highway. The existing highway will be widened asymmetrically to the west.

- 0.6 miles north of Whitney Street (PM 38.4) Four-lane divided expressway. The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 2.3 miles north of Whitney Street (PM 40.1) Four-lane divided expressway. The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.

- End Work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 41.8)

The four-lane all-paved highway would consist of four 12-foot lanes and 10-foot outside shoulders, with the northbound and southbound lanes separated by a 14-foot paved median. The new facility would be widened asymmetrically to conform to existing environmental and right of way constraints.

In particular, the segment north of SR 190 would be widened to the west to avoid wetlands that exist in the irrigated pasture lands to the east. Access would not be controlled and the paved median would be delineated for turning movements, which would allow the existing access through the corridor to be preserved. Due to the access considerations, the all-pave segments would be designated as conventional highway and would be designed for a 65 mph design speed.

The four-lane divided highway would consist of four 12-foot lanes, with 5-foot inside shoulders and 10-foot outside shoulders. The new lanes would be constructed parallel to the existing lanes and would be separated by at least a 100-foot unpaved median. In the segments on the north and south sides of the project, access from the side would be controlled to existing intersections and other significant access points and access across the facility would be restricted to at-grade median crossovers.

The segment of divided highway between PM 35.6 and PM 37.3 would not have controlled access and would be designated as conventional highway. The four-lane divided highway would meet expressway standards and would be designed for a 75 mph design speed.

This alternative uses the existing highway and would be constructed largely at grade, so there would be limited opportunity for adjustments in horizontal and vertical alignment. The existing substandard curve at PM 37.2 would be replaced with a larger curve, but otherwise the new alignment will follow the existing horizontal alignment. Similarly, the vertical profile would only be changed appreciably near PM 40.0 on the north side of Willow Dip to improve sight distance. In addition, the roadway cross-slopes in the new facility would vary due to conforming to the existing roadway.

There are two structures associated with this alternative. A reinforced concrete bridge would be built near PM 31.3 and would carry the new southbound lanes across the Los Angeles Aqueduct. A new reinforced concrete box culvert may also be required near PM 37.30 and would carry the N. Fork of Cartago Creek under the new all-pave facility. There would be no undercrossings proposed for this alternative.

Alternative 2

This alternative proposes constructing a controlled access four-lane divided expressway throughout the project. In Olancha, the new expressway facility would follow the existing highway alignment, but would be constructed adjacent to the existing highway. Through Cartago and north to the end of the project, the new expressway would still follow the existing alignment, but would incorporate the existing lanes into the new facility. This alternative would provide the ultimate concept facility for U.S. 395.

The proposed segments of this alternative are as follows:

- Begin Work – 0.45 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.8) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 1.1 miles south of Cactus Flat Road (PM 31.5) New northbound and southbound lanes will be constructed to the east of the existing highway.

- 0.3 miles south of SR 190 junction (PM 34.4) New northbound and southbound lanes will be constructed to the west of the existing highway.

- 0.3 miles south of Lake Street (PM 37.3) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 2.3 miles north of Whitney Street (PM 40.1) The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.

- End Work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 41.8)

The four-lane divided expressway would consist of four 12-foot lanes, with 5-foot inside shoulders and 10-foot outside shoulders. The northbound and southbound lanes would be separated by at least a 100-foot unpaved median. Access from the side would be controlled to existing intersections and other significant access points and access across the facility would be restricted to at-grade median cross-overs. With controlled access and divided lanes, the traveling speeds are anticipated to be higher, so the new expressway facility would be designed for a 75 mph design speed.

This alternative would be constructed parallel to the existing highway. However, construction of a new facility would allow the improvement of the existing horizontal alignment with larger radius curves. The facility would again be constructed largely at-grade, with the only major adjustment in vertical profile occurring at the passing lanes north of Willow Dip. The new construction would also provide consistent roadway cross-slopes.

The existing highway would be extended along the new alignment to SR 190 and would be converted to frontage road between PM 31.9 and PM 37.1. With connections at major intersections and at either end, the frontage road would serve as a collector road to the new expressway. It would also preserve the existing uses and access on the southwest and northeast sides of Olancha. Once the project is completed, the frontage road would be relinquished to Inyo County.

Access to the new expressway would be provided at existing intersections with State Route 190 and several Inyo County roads: Cactus Flats Road, Walker Creek Road, Fall Road, School Street, Lake Street, and Whitney Street. The intersections would be reconstructed and realigned to conform to the new facility. Access to parcels abutting the existing highway would be provided from the proposed frontage road, existing dirt roads, and other significant access points.

There are several structures associated with this alternative. A reinforced concrete bridge would be built near PM 31.30 and would carry the new southbound lanes over the Los

Angeles Aqueduct. Two reinforced concrete box culverts may also be required near PM 37.30 to carry the N. Fork of Cartago Creek under the new expressway. Two reinforced concrete box culverts are also proposed near PM 38.30 and would serve as multi-purpose undercrossings under the new expressway. Minor grading would be required to construct a new dirt road to connect to existing dirt roads nearby.

Alternative 2A

This alternative is similar to Alternative 2 and proposes constructing a controlled access four-lane divided expressway throughout the project. In Olancha, the new expressway facility would still follow the existing highway alignment, but would be constructed adjacent to the existing highway.

Instead of passing through Cartago, though, this alternative would pass to the west of Cartago and then return to the existing alignment. This alternative would also provide the ultimate concept facility for U.S. 395.

The proposed segments of this alternative are as follows:

- Begin Work – 0.45 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.8) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.
- 1.1 miles south of Cactus Flat Road (PM 31.5) New northbound and southbound lanes will be constructed to the east of the existing highway.
- 0.3 miles south of SR 190 junction (PM 34.4) New northbound and southbound lanes will be constructed to the west of the existing highway.
- 0.9 miles north of SR 190 junction (PM 35.6) New northbound and southbound lanes will be constructed to the west of the existing highway and will pass west of Cartago.
- 0.8 miles north of Whitney Street (PM 38.6) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.
- 2.3 miles north of Whitney Street (PM 40.1) The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.
- End Work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 40.8)

As with Alternative 2, this alternative would be constructed parallel to the existing highway through Olancha. Beginning at PM 35.6, the alignment would diverge from the existing highway as it passes to the west of Cartago and then return to the existing highway near PM 38.6. Due to this diversion, this alternative would require a significant change in vertical profile as it climbs the alluvial fan to the west of Cartago. The diversion also makes this alternative longer by about 0.3 miles.

The existing highway would still be converted to a frontage road, but the frontage road would extend further to the north of Cartago to join the new alignment, which would preserve the existing uses and access through Cartago as well. The length of frontage road that would be relinquished to Inyo County would be increased to 6.2 miles. The number of access points to the new expressway would be reduced by one as the intersections at Lake Street and Whitney Street would now connect to the frontage road. An additional access point would be provided south of the Crystal Geyser Bottling Plant to improve their access to the new expressway.

The number of structures required with this alternative ~~would not~~ change. However, the western alignment would change the location of the proposed reinforced concrete box culverts. The box culverts required for the N. Fork of Cartago Creek would be relocated to the west as would the box culverts required for the proposed multi-purpose undercrossings. The relocated undercrossings would require additional grading to restore access to the existing dirt roads in the area. There would also be an alternative location available for the multi-purpose undercrossings just south of Owens Street.

Alternative 3

This alternative is also similar to Alternative 2 and would construct a controlled access four-lane divided expressway throughout the project. Rather than following the existing highway, the proposed alignment would pass to the west of Olancha and return to the existing alignment south of Cartago.

Through Cartago and north to the end of the project, the new expressway would follow the existing alignment and would incorporate the existing lanes into the new facility. This alternative would also provide the ultimate concept facility for U.S. 395.

The proposed segments of this alternative are as follows:

- Begin Work – 0.45 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.8) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 0.5 miles south of Cactus Flat Road (PM 32.1) New northbound and southbound lanes will be constructed to the west of the existing highway and will pass west of Olancha.

- 0.3 miles south of Lake Street (PM 37.3) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 2.3 miles north of Whitney Street (PM 40.1) The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.

- End Work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 41.8)

Beginning at PM 32.1, the alignment for this alternative diverges from the existing highway as it passes to the west of Olancha and then returns to the existing highway near PM 37.3. Due to the diversion, this alternative would require a significant change in vertical profile as it climbs the alluvial fan west of Olancha. It would also require that SR 190 be extended approximately 0.7 miles to meet the proposed alignment. The diversion makes this alternative about 0.2 miles longer.

The existing highway would be converted to frontage road, but the frontage road would begin near PM 37.3 and extend south of Olancha to join the proposed alignment near PM 32.4. The length of frontage road that would be relinquished to Inyo County would be reduced to 4.8 miles. The number of access points to the new expressway would be reduced by five as several of the access points in the Olancha area would now connect to the frontage road. Access would still be provided at the existing intersections with Lake Street and Whitney Street in Cartago.

The number of structures and location of structures required for this alternative would change due to the western alignment. Rather than being distributed through several irrigation channels, the crossing of Olancha Creek would occur at one location in an incised channel and could require reinforced concrete box culverts. Box culverts would still be required for the crossing of the N. Fork of Cartago Creek and the proposed multi-purpose undercrossings north of Cartago. An alternative or additional location for multi-purpose undercrossings would also be available near Olancha Creek.

Alternative 4 (*All West Alternative*)

This alternative would construct a controlled access four-lane divided expressway for the entire length of the project. The new expressway would be constructed west of the Los Angeles Aqueduct and would pass to the west of both Olancha and Cartago. It would return to the existing highway north of Cartago and continue to follow the existing alignment to the end of the project, incorporating the existing lanes into the new facility.

The proposed segments of this alternative are as follows:

- Begin Work – 1.4 miles south of L.A. Aqueduct Bridge, #48-10 (PM 29.9) The existing lanes would be rehabilitated for use as northbound and southbound lanes.

- 1.3 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.0) New northbound and

- southbound lanes will be constructed to the west of the existing highway and will pass west of Olancha and Cartago.

- 1.3 miles north of Whitney Street (PM 39.1) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 2.3 miles north of Whitney Street (PM 40.1) The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.

- End Work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 41.8)

This alternative would construct a four-lane divided expressway similar to Alternative 2. However, the location of the facility would be much higher on the alluvial fans west of Olancha and Cartago.

As a result, there would be substantial changes from the existing profile and considerably more earthwork. The proposed alignment would also be about 1.5 miles longer and would require that SR 190 be extended approximately 1.1 miles to meet the proposed alignment. Due to the increases in length and earthwork, this alternative has the highest cost of all alternatives.

The existing highway would be converted to frontage road. The frontage road would begin near PM 30.4 and continue north along the existing alignment to join the proposed alignment north of Cartago.

The length of frontage road that would be relinquished to Inyo County would increase to 7.6 miles. The number of access points to the new expressway would be reduced to only three – the intersection with SR 190 and the southern and northern termini of the frontage road – and all existing roads would connect to the proposed frontage road.

This alternative would be west of the Los Angeles Aqueduct and would not enjoy the protection from alluvial flooding that the aqueduct currently provides. As a result, a significantly larger drainage network would be required to protect the roadway from potential flooding. It may even be necessary to construct drainage channels along the western boundary of the roadway to intercept and collect major storm flows.

This alternative would also require substantially more structures. Two bridges would be required to carry the southbound and northbound lanes across the Los Angeles Aqueduct west of Cartago. An additional bridge would also be required to carry the extension of SR 190 across the Los Angeles Aqueduct. There would also be a substantial increase in the number of box culverts. The proposed undercrossings would be constructed, and would meet an added need of providing access under the new facility for migrating deer. The proposed locations for box culverts are shown below:

<u>PM - Description</u>

31.3 - Dry Wash

32.0 - Dry Wash

34.7 - Olancha Creek

36.6 - S. Fork Cartago Creek

37.6 - N. Fork Cartago Creek

38.5 - Multi-purpose undercrossing

34.7 - Multi-purpose undercrossing (alternative site)

No Build Alternative

The "No Build" Alternative would leave this segment of U.S. 395 in its current configuration as a two-lane conventional highway. This would not address the project purpose and need to increase safety, improve level of service, and provide four-lane route continuity. As traffic volumes increase, the level of service will continue to deteriorate and the number of accidents would be expected to continue to increase. As a result, this alternative is not recommended.

Rejected Alternatives

<u>Alternative 3A</u>

As noted in the Project History Section, Alternative 3A was developed as a result of a Value Analysis Report (VAR) that was prepared for this project. This alternative would have passed to the west of both Olancha and Cartago, but would have stayed on the east side of the Los Angeles Aqueduct.

However, private development had increased along the proposed alignment for Alternative 3A since it was developed in 2000. Since Alternative 4 would have served the same purpose and would not require the take of the recently developed land, Alternative 4 was chosen over Alternative 3A. In addition, Alternative 3A would have had significantly higher noise and traffic impacts due to its proximity to the communities. As a result, Alternative 3A was rejected by the Project Development Team in the summer of 2007 in favor of Alternative 4.

Alternative 2R (*Design Option 2R*)

This alternative was the original alignment for Alternative 2 that was developed in early bypass studies and was included in the 1999 PSR-EO. It would have followed the same alignment as Alternative 2, except that the alignment would have continued past SR 190 (PM 34.6) on the east side of the existing highway up to about PM 35.6, where it would have crossed back over to the west of the existing highway. Since this alignment would significantly reduce the right of way impacts, the cost of construction, and some of the environmental impacts in northwestern Olancha, it was reevaluated during the consideration of alternatives for this project.

However, wetlands were determined to be present in the pasturelands north of SR 190 and east of the existing highway. Since jurisdictional wetlands must be avoided, this alternative was removed from consideration.

Mobile Source Air Toxics

In addition to the criteria air pollutants discussed above for which there are National Ambient Air Quality Standards, the U.S. Environmental Protection Agency also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (for example, aircraft), area sources such as dry cleaners, and stationary sources, typically factories or refineries. Mobile Source Air Toxics are a subset of the 188 air toxics defined by the Clean Air Act. The Mobile Source Air Toxics 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.

Studies of the human health risks are inconclusive, however, and the Environmental Protection Agency has yet to establish air quality standards or guidelines for assessing the project-level effects of mobile air toxics. Such limitations make the study of mobile air toxic concentrations, exposures, and health impacts difficult and uncertain, especially on a quantitative basis.

This Initial Study/Environmental Assessment includes a basic analysis of the likely Mobile Source Air Toxics emission impacts of this project. However, available technical tools do not enable the ability to predict the project-specific health impacts of the emission changes associated with the alternatives in this document. Evaluating the environmental and health impacts from Mobile Source Air Toxics on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling to estimate ambient concentrations resulting from the estimated emissions, exposure modeling to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the Mobile Source Air Toxics health impacts of this project.

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of Mobile Source Air Toxics emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of Mobile Source Air Toxics at the project level, it is possible to qualitatively assess the levels of future Mobile Source Air Toxics emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from Mobile Source Air Toxics, it can give a basis for identifying and comparing the potential differences among Mobile Source Air Toxics emissions, if any, from the various alternatives.

The qualitative assessment presented below is derived in part from a study conducted by the Federal Highway Administration entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at: www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm

For each alternative in this document, the amount of Mobile Source Air Toxics emitted would be proportional to the vehicle miles traveled, assuming that other variables such as fleet mix are the same for each alternative. The vehicle miles traveled estimated for each of the build alternatives is slightly higher than that for the No-build Alternative because the additional capacity increases the efficiency of the roadway. This increase in vehicle miles traveled would lead to higher Mobile Source Air Toxics emissions for the selected build alternative along the highway corridor, along with a corresponding decrease in Mobile Source Air Toxics emissions along the parallel routes. The emissions increase is offset somewhat by lower Mobile Source Air Toxics emission rates due to increased speeds; according to the Environmental Protection Agency's MOBILE6 emissions model, emissions of all of the priority Mobile Source Air Toxics except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emission decreases would offset emission increases related to vehicle miles traveled cannot be reliably projected due to the inherent deficiencies of technical models.

Because the estimated vehicle miles traveled under each of the proposed alternatives are nearly the same, varying by less than one percent, it is expected there would be no appreciable difference in overall Mobile Source Air Toxics emissions among the various alternatives. Also, regardless of the alternative chosen, emissions would likely be lower than present levels in the design year as a result of the Environmental Protection Agency's national control programs that are projected to reduce Mobile Source Air Toxics 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, vehicle miles traveled growth rates, and local control measures. However, the magnitude of the reductions projected by the Environmental Protection Agency is so great (even after accounting for vehicle miles traveled growth) that Mobile Source Air Toxics emissions in the study area are likely to be lower in the future in nearly all cases.

Climate, Topography, and Local Air District

The project is located on the floor of the Owens Valley with the Sierra Nevada to the west and the Inyo and Coso mountain ranges to the east. This area lies in the rain shadow of the Sierra Nevada where the climate has extreme daily temperature fluctuations and strong seasonal winds. In late winter and early spring, the wind is a prominent feature, with dry winds blowing in the afternoon and evening. Winds in excess of 25 miles per hour, with gusts of 75 miles per hour or more are not uncommon. The average annual precipitation is 4 inches.

The Great Basin Unified Air Pollution Control District administers air quality regulations developed at the federal, state, and local levels.

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

Memorandum

Serious drought.
Help save water!

To: JENNIFER LUGO
Associate Environmental Planner

Date: 4/8/15

From: KEN J ROMERO, Chief
Central Region Environmental Engineering Branch

File: EA 09-21340
INY 395
PM 29.2/41.8

Subject: AIR STUDY REVALIDATION FOR OLANCHA CARTAGO 4 LANE

LOCATION: State Route 395 in Inyo County

INTRODUCTION

A request for an addendum to the September 2010 Environmental Impact Report/Environmental Assessment was received in March 2015.

The project changes are as follows:

Selection of a preferred alternative was made by combining Alternatives 3 and 4 to create an alternative that minimized impacts and maximized benefits of the project. Following the Director's decision, Caltrans performed additional studies to further identify the impacts of the project. Based on the results of these studies, as well as review of the public and agency comments received during circulation of the Draft Environmental Document, Caltrans decided that the potential exists that impacts to cultural resources may not be mitigated to a point where they are not significant. Therefore, a decision was made to elevate the CEQA document level to a Draft Environmental Impact Report and to circulate the findings of this new document to the public.

Alternative 1 proposes constructing segments of conventional all-paved, conventional divided and controlled-access four-lane divided highway along the existing U.S. Highway 395 alignment.

Alternative 2 proposes construction of a controlled-access four-lane divided expressway with the northbound and southbound lanes separated by at least a 100-foot-wide unpaved median throughout the project along the existing U.S. Highway 395 alignment.

Alternative 2A is a variation of Alternative 2 and proposes that the controlled-access divided four-lane expressway be constructed west of the community of Cartago with the northbound and southbound lanes separated by at least a 100-foot-wide unpaved median throughout.

Alternative 3 proposes construction of a controlled-access divided four-lane expressway to the west of the community of Olancha with the northbound and southbound lanes separated by at least a 100-foot-wide unpaved median throughout the project.

Alternative 4 proposes construction of a controlled-access divided four-lane expressway to the west of the communities of Olancha and Cartago with northbound and southbound lanes separated by a variable-width median throughout the project to avoid utilities.

The Recommended Preferred Alternative is a combination of Alternatives 3 and 4. The combined alternative would construct a controlled-access four-lane divided expressway that would pass west of Olancha and the Los Angeles Aqueduct (Alternative 4). Once the alignment crosses Olancha Creek, this alternative would cross the Los Angeles Aqueduct and continue north through Cartago along the existing highway to meet up with the four-lane section of U.S. Highway 395 to the north (Alternative 3). The northbound and southbound lanes would be separated by a 100-foot-wide unpaved median.

The No-Build Alternative would leave the facility as it currently exists.

ANALYSIS

Particulate Matter

The proposed project is located in Owens Valley, within Inyo County. Inyo County is within the Great Basin Valleys Air Basin that is classified as non-attainment for federal and state PM10 and non-attainment for state PM2.5. A regional and local air conformity hot spot analysis was conducted in January 2014. The Interagency Partners concurred that this was not a Project of Air Quality Concern on February 19, 2014, and the project is not expected to cause or contribute to an exceedence of the federal PM standards. The main contributor to the PM10 pollution in the Owens Valley is dust from the dry lake bed.

Carbon Monoxide (CO)

The Great Basin Valleys Air Basin is in attainment for both the federal and state standards. The project is not expected to cause or contribute to an exceedence of the federal or state standards.

Climate Change

Estimated recent and future Carbon Dioxide (CO_2) emissions are shown in Table 1. The emissions in Table 1 were modeled using the traffic data in Table 2. The Vehicle Miles Travelled (VMT) used to calculate the emissions is obtained by multiplying the Annual Average Daily Traffic (AADT) for the alternative times the length in miles of the alternative. The AADT was the same for each alternative. Therefore, there was a slight difference between the VMT for each alternative. CO_2 emissions are proportional to the VMT, so the preferred alternative would have less CO_2 emissions than Alternative 4, but more emissions than Alternatives one, two or three.

Table 1 Estimated Daily CO2 Emissions in Metric Tons

Year			2012		2019		2029		2039	
Alternative	Length	Speed	CO_2-	CO2 – Pavley[1]-	CO_2	CO_2 – Pavley-	CO_2	CO_2 – Pavley-	CO_2	CO_2– Pavley-
Existing	11.06	55	29.86	32.04	X	X	X	X	X	X
No Build	11.06	55	X	X	32.21	26.93	34.36	26.72	36.81	28.43
1	11.06	55	X	X	32.21	26.93	34.36	26.72	36.81	28.43
2	11.08	65	X	X	36.11	29.96	38.41	29.50	41.06	31.29
2A	11.39	65	X	X	37.12	30.80	39.48	30.33	42.20	32.17
3	11.27	65	X	X	36.73	30.48	39.07	30.01	41.76	32.57
4	12.57	65	X	X	40.97	33.99	43.57	33.47	46.57	35.50
Rec Preferred	12.14	65	X	X	39.57	32.83	42.08	32.32	44.99	34.29

Source: Caltrans Central Region Environmental Engineering using CT-EMFAC 2011 and Caltrans District 9 Traffic Calculations. 1 Pavley refers to the impacts of recently adopted diesel regulations including the Truck and Bus Rule and other diesel truck fleet rules: the Pavley Clean Car Standard, and the Low Carbon Fuel Standard.

Table 2 Traffic Data

Traffic Data	2012	2019	2024	2029
Average Annual Daily Traffic	5,300	5,490	5,630	5,770
Percent Trucks	20.3	20.3	20.3	20.3
20-Year Growth Rate (percent)	-	0.5	0.5	0.5

Source: 2010 and 2013 Caltrans Traffic Studies

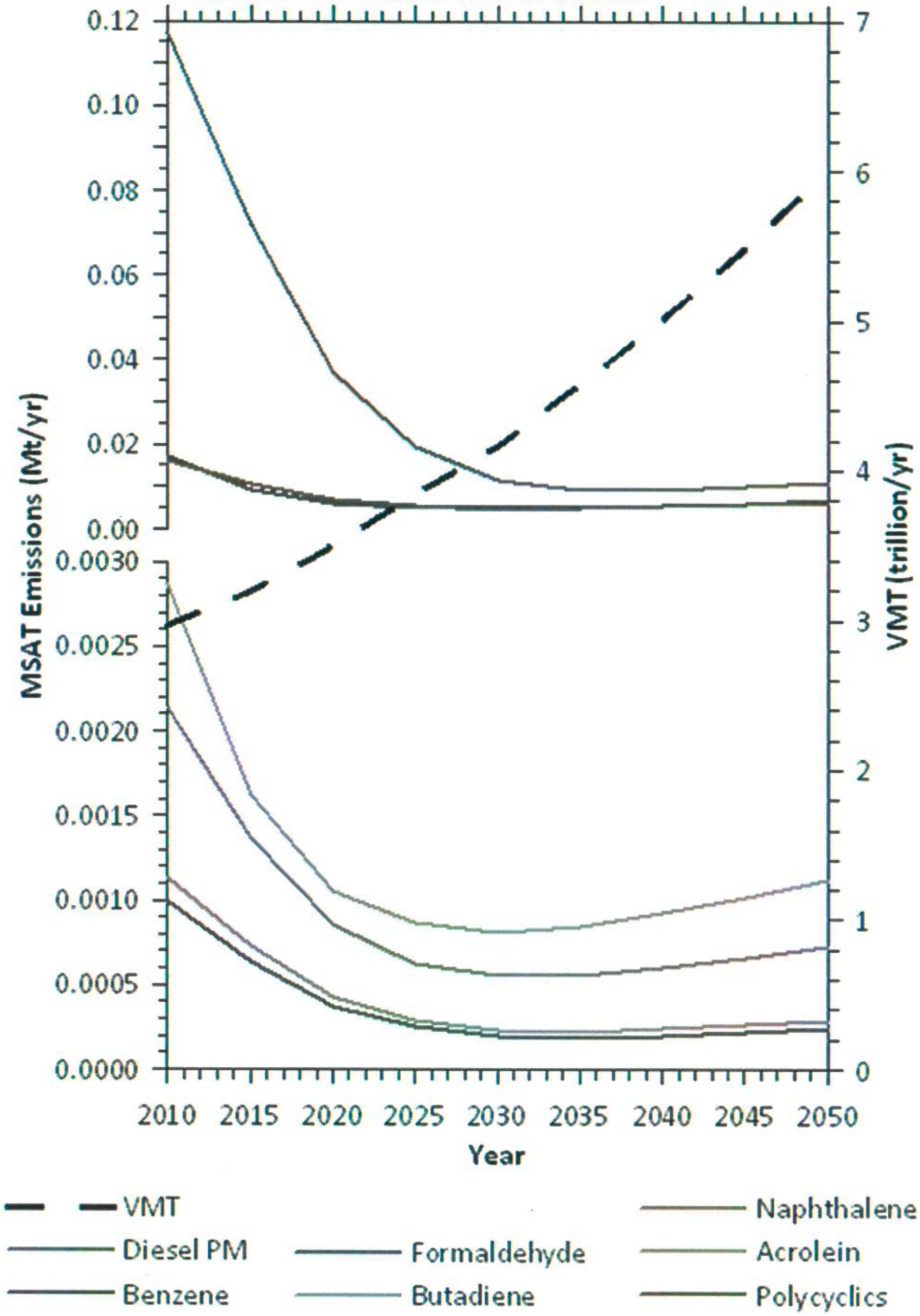
Mobile Source Air Toxics
Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). The common Mobile Source Air Toxics (MSAT) are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules. The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines.

MODELING According to EPA, Motor Vehicle Emission Simulator (MOVES) model is based on a vast amount of in-use vehicle data collected and analyzed. Analysis of this data enhanced EPA's understanding of how mobile sources contribute to emissions inventories and the relative effectiveness of various control strategies. In California, however, the Emission FACtor (EMFAC) model is similar and is approved for use by the EPA.

Based on an FHWA analysis using EPA's MOVES2010b model, as shown in Figure 1, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.

Figure 1 NATIONAL MSAT EMISSION TRENDS 1999 - 2050 FOR VEHICLES OPERATING ON ROADWAYS USING EPA's MOVES2010b MODEL



Source: FHWA website: http://www.fhwa.dot.gov/environment/air_quality/air_toxics/

The FHWA developed a tiered approach with three categories for analyzing MSAT in NEPA documents, depending on specific project circumstances:

1. No analysis for projects with no potential for meaningful MSAT effects;

2. Qualitative analysis for projects with low potential MSAT effects; or

3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

The Project best fits into Category 2, a project with low potential MSAT effects. The types of projects included in this category are those that serve to improve operations of highway, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions. This category covers a broad range of projects. Examples of these types of projects are minor widening projects; new interchanges, replacing a signalized intersection on a surface street; or projects where design year traffic is projected to be less than 140,000 to 150,000 annual average daily traffic (AADT). The horizon year AADT for this project is less than 6,000 (see Table 2, which is well below the 140,000 AADT.

For each alternative proposed for this project, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or 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 the same as the No Build Alternative, because the additional capacity would improve Level of Service and improve safety. This increase in VMT would lead to higher MSAT emissions for the preferred action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds. Because the estimated VMT under each of the Alternatives are nearly the same, varying by less than 5 percent, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050.

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 EPA-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.

DISCUSSION: The Olancha-Cartago 4-Lane project is expected to result in a minimal increase in travel speeds. The project is not expected to attract more local traffic as this is a rural route. There is no difference between the Build and No Build Alternatives' AADT. MSAT emissions are proportional to Vehicle Miles Travelled (VMT). VMT is determined by multiplying the length of a project times by the AADT. Current and future improvements in gasoline and diesel engines are expected to result in lower MSAT emissions than today. Because of the minimal to no difference between the Build and No Build traffic, this project is expected to have minimal to no increase in MSAT by the project horizon year.

INCOMPLETE OR UNAVAILABLE INFORMATION FOR PROJECT-SPECIFIC MSAT HEALTH IMPACTS ANALYSIS

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

Studies of the human health risks are inconclusive, however, and the Environmental Protection Agency has yet to establish air quality standards or guidelines for assessing the project-level effects of mobile source air toxics. Such limitations make the study of mobile source air toxics concentrations, exposures, and health impacts difficult and uncertain, especially on a quantitative basis.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by Health Effects Institute (HEI) (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process does not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of Mobile Source Air Toxics emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of Mobile Source Air Toxics at the project level, it is possible to qualitatively assess the levels of future Mobile Source Air Toxics emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from Mobile Source Air Toxics, it can give a basis for identifying and comparing the potential differences among Mobile Source Air Toxics emissions, if any, from the various alternatives.

The qualitative assessment presented below is derived in part from a study conducted by the Federal Highway Administration entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at: www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm.

For each alternative in this document, the amount of Mobile Source Air Toxics emitted would be proportional to the vehicle miles traveled, assuming that other variables such as fleet mix are the same for each alternative. The vehicle miles traveled estimated for each of the build alternatives is slightly higher than that for the No-Build Alternative because the additional capacity increases the efficiency of the roadway. This increase in vehicle miles traveled would lead to higher Mobile Source Air Toxics emissions for the Recommended Preferred Alternative along the highway corridor, along with a corresponding decrease in Mobile Source Air Toxics emissions along the parallel routes. The emissions increase is offset somewhat by lower Mobile Source Air Toxics emission rates due to increased speeds; according to the Environmental Protection Agency's MOBILE6 emissions model, emissions of all of the priority Mobile Source Air Toxics except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emission decreases would offset emission increases related to vehicle miles traveled cannot be reliably projected due to the inherent deficiencies of technical models.

Table 3 Daily MSAT Emissions in grams/day

	Acrolein	Benzene	Butadiene	Diesel PM	Formaldehyde	POM	Napthalene
Existing 2012	424	12,482	1,953	55,242	6,445	288	567
2019 No Build	151	5,587	700	16,697	7,098	100	300
2019 Alt 1	151	5,587	700	16,697	7,098	100	300
2019 Alt 2	196	6,409	889	22,188	7,568	127	346
2019 Alt 2A	201	6,588	914	22,803	7,780	131	356
2019 Alt 3	199	6,519	904	22,568	7,698	129	352
2019 Alt 4	222	7,271	1,009	25,171	8,586	144	393
Recommended Preferred	214	7,022	974	24,310	8,292	139	379
2029 No Build	86	3,752	429	16,697	6,077	95	237
2019 Alt 1	86	3,752	429	16,697	6,077	95	237
2019 Alt 2	118	4,327	566	22,004	6,223	121	277
2019 Alt 2A	121	4,448	582	22,620	6,398	125	286
2019 Alt 3	120	4,401	576	22,382	6,330	123	283
2019 Alt 4	134	4,908	642	24,963	7,060	138	315
Recommended Preferred	129	4,741	620	24,109	6,819	133	304

Source: Central Region Environmental Engineering Branch CT-EMFAC version 5 runs, March 2015

Improvements in fuel formulations and in gas and diesel engine emission controls are expected to result in an overall decline for each MSAT over the next 20-30 years. This trend is shown by comparing the existing year (2012) and open to traffic year (2019) or the horizon year (2029). Both the No Build Alternative and Alternative 1 have lower MSAT emissions in 2019 and 2029 than the other Build alternatives. This is due to the lower speed of 55 miles per hour (MPH) for the two alternatives. The lowest MSAT emissions occur at about 45 MPH. The Recommended Preferred Alternative has slightly lower emissions than Alternative 4, due to Alternative 4 being about 1/2 mile longer (Table 2 and Table 3) than the Recommended Preferred Alternative.

CONSTRUCTION EMISSIONS

Most of the construction impacts to air quality are short term in duration and therefore will not result in adverse or long-term conditions. Implementation of the following measures will reduce any air quality impacts resulting from construction activities:

- Water or dust palliative will be applied to the site and equipment as frequently as necessary to control fugitive dust emissions.
- Soil binder will be spread on any unpaved roads used for construction purposes and on all parking areas for project construction.
- Trucks will use stabilized construction entrances as they leave the right-of-way to control fugitive dust emissions.
- Construction equipment and vehicles will be properly tuned and maintained. Low sulfur fuel would be used in all construction equipment as provided in California Code of Regulations Title 17, Section 93114.
- A dust control plan addressing sprinkling, temporary paving, and speed limits will be developed to minimize construction impacts to existing communities. Equipment and materials storage sites will be located as far away from residences as practical. Construction areas would be kept clean and orderly.
- Track-out reduction measures such as gravel pads will be used at project access points to minimize dust and mud deposits on roads affected by construction traffic.
- To the extent feasible, all transported loads of soils will be covered and wet prior to transport, or adequate freeboard (space from the top of the material to the top of the truck) will be provided to reduce PM_{10} and deposition of particulates during transportation.
- Dust and mud that are deposited on paved, public roads due to construction activity and traffic will be removed to reduce particulate matter.
- Mulch or plant vegetation will be installed as soon as practical after grading to reduce windblown particulates in the area.
- Equipment and materials storage sites will be located as far away from residences as practical. Construction areas would be kept clean and orderly.

KJR/tg

Noise Study Report and Addendums

Noise Impact Technical Report

California Department of Transportation-District 9
EA: 09-213400
Inyo-395
KP 49.6/66.5
(PM 30.8/41.3)
July 24, 2003

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EXECUTIVE SUMMARY

The purpose of this report is to comply with Federal, State and Local regulations and requirements regarding highway traffic noise. The principal laws and regulations are from Title 23, Section 772 of the Code of Federal Regulations (23 CFR 772), National Environmental Policy Act, California Environmental Quality Act (CEQA), and the California Streets and Highways Code, Section 216.

The project begins at KP 49.6 and ends at KP 66.9. This project will result in construction of a four-lane expressway for U.S. Route 395. The intent of the project is to upgrade the existing 2-lane conventional highway to a 4-lane expressway, or partial conventional 4-lane highway, improving level of service, ease congestion, and improve the overall safety of the highway in the area. Three new alternatives and 1 no-build alternative are proposed.

Acoustic samples were taken at 13 individual locations selected for their proximity to the three different proposed alternatives. Site geometry for this project was not a simple, flat situation, due to the variability of elevations observed. The existing road itself had an approximate range of elevation from 1066.8 to 1219.2 meters (3500 to 4000 feet), and site locations increased in elevation as one traveled west to the base of the foothills of the Sierra Nevadas.

The samples collected during the week of May 5, 2003, indicated that the project area experiences sound pressure levels well below the federal noise abatement criteria for consideration of noise barriers. The observed sound pressure levels in the region ranged from 36.1 dBA to 56.5 dBA, with 36.1dBA being considered the minimum ambient sound pressure level. Future predicted noise levels range from 36.1 dBA to 65 dBA, depending upon the alternative. Given this information however, several substantial noise increases were identified at several locations resulting from the four proposed alternatives.

These substantial increases were analyzed using the Sound 32/2000 model. It was determined that only a small fraction of the substantial increases could be abated using exterior walls as sound barriers. Of those barriers determined to be acoustically feasible (Receivers 2 and 19), receiver 2 was judged as unreasonable based on the low frequency of human activity and 19 was deemed unreasonable based on the probable expense ($415.00/m^2 area) being greater than the allowable value of $27,000. The proposed length of the barrier would have been 92.4 m. Under CEQA, these barriers were considered for abatement and it has been determined due to the above statements that the project contains receptors that are not feasible or reasonable to abate.

Construction noise may result from this project, however, it will be temporary and be conducted in accordance with section 7-1.01I of the July 1999 Standard Specifications.

INTRODUCTION

Purpose

The purpose of this evaluation is to comply with California Department of Transportation noise policies, fulfilling the highway noise analysis and abatement/mitigation requirements stemming from these State and Federal regulations:

- Title 23 United States Code of Federal Regulations, Part 772 "Procedures for Abatement of Highway Traffic Noise and Construction Noise" (23 CFR 772).
- National Environmental Policy Act (NEPA)
- California Environmental Quality Act
- Section 216 of the California Streets and Highways Code

The Traffic Noise Analysis Protocol and Technical Noise Supplement represent the implementation of the policies of the California Department of Transportation and are utilized for this individual project.

Project Description

The project begins at KP 49.6 and ends at KP 66.9. This project will result in construction of a four-lane expressway for U.S. Route 395. The intent of the project is to upgrade the existing 2-lane conventional highway to a 4-lane expressway, or partial conventional 4-lane highway, improving level of service, ease congestion, and improve the overall safety of the highway in the area. The following alternatives are under consideration:

Alternative 1: Four Lane All Paved Highway on Existing State Route 395 Alignment

This alternative would widen the existing highway to an all paved section 24.6 meters wide. The typical section would provide for a 4.2 meter paved median, four 3.6 meter lanes and 3 meter outside paved shoulders.

Alternative 2: Four Lane Divided Expressway east of Existing State Route 395 Corridor

This alternative would utilize the existing highway from KP 49.6 to 51.3, for northbound traffic and new southbound lanes would be constructed west of the existing lanes. From KP 51.3 to KP 57.6, new north and southbound lanes would be constructed east of the new lanes. From KP 57.6 to KP 60.5 new lanes would be constructed west of the existing highway and new frontage road would be provided west of the new lanes. The existing highway would be utilized as a frontage road south of Cartago and would be relinquished to Inyo County as a county road. From Cartago to the end of the project, KP 60.0/66.9, the existing two-lane conventional highway would be improved to a four-lane divided expressway. The break down for the Cartago section is as follows: Existing northbound lanes would be constructed with a frontage road on the west of the new lanes for any land locked properties. From KP 64.1 to the end of the job at KP 66.9 new northbound lanes would be constructed and the existing lanes would be utilized for southbound traffic.

Alternative 3: Four Lane Divided Expressway west of Existing State Route 395 Corridor

This alternative would utilize the existing highway from KP 51.5 for northbound traffic and new southbound lanes would be constructed west of the existing lanes. From KP 51.5 new lanes would be constructed generally paralleling the LA Aquaduct for approximately 5.8 kilometers and then heading due north to intersect with the existing alignment in Cartago at KP 60.5. From Cartago north the alignment follows Alternative 2, KP 60.0/66.9. With this alternative, it is desirable to construct an extension of approximately 1.3 kilometers of State Route 190 to the west to join the new alignment, which will allow the relinquishment of the existing SR 395 highway, between KP 51.5 to KP 60.5 to the County of Inyo. Direct access and/or frontage roads would be provided for any land locked properties.

Alternative 4: No Build Alternative

The project study report contains details for all these alternatives

FUNDAMENTALS OF TRAFFIC NOISE

Noise is usually defined as unwanted sound. This definition includes the psychological and physical nature of the sound (AIHA, 1986). Under certain conditions, noise may cause hearing loss, interfere with human activities at home and work, and in various ways may affect a person's health and well being.

Sound pressure level (L_p) can vary over an extremely large range of amplitudes. The decibel (dB) is the accepted standard unit for measuring the amplitude of sound because it accounts for the large variations in amplitude and reflects the way people perceive changes in sound amplitude.

Human perception of sound is also frequency dependent. When describing sound and its effect on a human population, the A-weighted (dBA) sound levels are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the noise signal to emphasize frequencies in the middle of the audible spectrum and to de-emphasize low and high frequencies in a manner corresponding to the way the human ear perceives sound. The A-weighted noise level has been found to correlate well with people's judgements of the noisiness of different sounds and has been used for many years as a measure of community noise.

It is widely accepted that the average healthy ear can barely perceive noise level changes of 3 dBA. A change of 5 dBa is readily perceptible, and a change of 10 dBA is perceived as being twice or half as loud. A doubling of sound energy results in a 3-dBA increase in sound, which means that a doubling of sound energy (e.g., doubling the volume of traffic on a highway) would result in a barely perceptible change in sound level.

When noise propagates over a distance, changes in level and frequency content occur. Sound propagates differently depending on several factors such as its geometric spreading, ground absorption, atmospheric effects, and shieldings. In the case of highway traffic noise, the movement of vehicles on a highway makes the source of the sound appear to emanate from the line source. This line source results in cylindrical spreading of sound that results in sound level changes in of 3 dBA per doubling of distance from the highway.

Atmospheric conditions such as temperature, humidity, and wind turbulence and direction also influence the propagation of sound and must be considered as well. For example, receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lower noise levels. Increased sound levels can also occur as a result of temperature inversion conditions (i.e., increasing temperature with elevation).

A large object or barrier in the path between a noise source and a receiver can also substantially attenuate noise levels at the receiver. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dBA of noise reduction.

Noise descriptors have been established to quantify noise levels over varying time periods. Community noise levels may change continuously during the day; however, community noise exhibits a daily, and yearly pattern. One of the most common descriptors is the energy equivalent sound level (L_{eq}). The L_{eq} is the equivalent, A-weighted steady-state sound level that, in a specific hour, contains the same acoustic energy as a time-varying sound level during the same hour.

Peak-hour L_{eq} is normally used to evaluate noise impacts from a roadway. When the peak-hour noise level is reduced to an acceptable level, the hourly noise levels of other hours of the day will also be below the acceptable noise limit. Hourly L_{eq} is normally used to evaluate noise impacts from a roadway. When the peak-hour noise level is reduced to an acceptable level, the hourly noise levels of the other hours of the day will also be below the acceptable noise limit. Hourly L_{eq} is used by the FHWA and Caltrans to conduct noise studies and design noise abatement measures, such as soundwalls.

Table N-2136.2 - Typical Noise Levels

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

Table 1. Typical Noise Levels

APPLICABLE POLICIES AND PROCEDURES

Federal regulations and policies related to the exposure of the public to traffic noise are discussed in detail in the Caltrans Traffic Noise Analysis Protocol. Projects affected by the protocol and other noise regulations are referred to as Type I projects. Type I projects are defined by 23 CFR 772 as a proposed Federal or Federal-aid highway project for the construction of a highway on a new location, or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment, or increase of through traffic lanes. Caltrans extends the Type I definition to State highway projects without federal funding.

FEDERAL

Along with the above definition of a Type I project, the Federal Highway Administration (FHWA) has interpreted this definition to include any project that has the potential to increase noise levels at adjacent receivers.

National Environmental Policy Act (NEPA)

NEPA is the federal law that establishes federal environmental policy, provides the interdisciplinary framework through which the federal agencies are to prevent environmental damage, through the Council for Environmental Quality (CEQ) and contains procedures to ensure federal agency decision makers account for environmental interests within their projects. Under NEPA, methods to mitigate for adverse environmental impacts must be identified. Title I, Section 101(b)(2) states:" Assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;"

FHWA Regulations

The federal noise standard is provided in 23 CFR 772 along with procedures for conducting highway-project noise studies. The section also provides procedures for implementing noise abatement measures to help protect the public health and welfare, supply noise abatement criteria (NAC), and establish requirements for information to be given to local officials for planning and design uses concerning highways. Under the regulation, noise abatement must be considered for a Type I project if the project is predicted to result in a traffic noise impact. A traffic noise impact is considered to have occurred if the project results in a substantial noise increase or if the predicted noise levels approach or exceed NAC specified in the regulation. 23 CFR 772 leaves the interpretation of the terms "approach" and "substantial increase" to the interpretation of individual states.

Federal Noise Abatement Criteria (NAC) under federal regulations are summarized in Table 2.

STATE

California Environmental Quality Act

California Environmental Quality Act (CEQA) is the foundation for environmental law and policy in California. Its objective is to disclose to decision makers and the public the significant environmental effects of proposed activities and identify ways to avoid or reduce those effects by requiring implementation of feasible alternatives or mitigation measures. Under CEQA, a substantial noise increase may result in significant adverse environmental effects and, if so, must be mitigated or identified as a noise impact for which it is likely that only partial (or no) mitigation measures are available. Specific economic, social, environmental, legal, and technological conditions may make noise mitigation measures infeasible.

California Streets and Highways Code, Section 216

Section 216 of the California Streets and Highways Code refers to the noise level produced by the traffic on, or by the construction of, a state freeway measured in the classrooms, libraries, multipurpose rooms, and spaces used for pupil personnel services of a public or private elementary or secondary school. The code states that if the interior noise level produced by the freeway exceeds 52 dBA –L_{eq} or less by measures including, but not limited to, installing acoustical materials, eliminating windows, installing air conditioning, and constructing sound baffle structures.

Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects

The Traffic Noise Analysis Protocol specifies the policies, procedures, and practices to be executed by agencies sponsoring new construction projects such as this one. Noise abatement criteria (NAC) specified in 23 CFR 772 are used to define environmental impacts resulting from noise sources. 23 CFR 772 defines an noise increase as substantial when the predicted noise levels with project implementation exceed existing noise levels by 12 dBA-L_{eq}(h). The Traffic Noise Analysis Protocol states that a sound level is considered to approach an NAC level when the sound level is within 1 dB of the NAC identified in 23 CFR 772.

Other considerations of the protocol that potentially apply to this project include Section 5.6, which outlines “Unusual and Extraordinary Abatement Measures”. In such cases, insulation can only be installed in instances where the substantial noise increases exceed 30 dBA over existing ambient levels and the absolute noise level after project exterior noise level is greater than 75 dBA.

Table 2. Federal Activity Categories and Noise Abatement Criteria

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

STUDY METHODS AND PROCEDURES

Site Selection

Measurement sites were selected based on their proximity to the source (State Route 395) and their land use as a residential or commercial site (refer to **Existing Noise Environment**). Locations that were identified as having the most potential for human occupancy in proximity to highway sources were selected. Individual site conditions such as acoustically "soft" or "hard" conditions were noted. A considerable factor in site selection was the geographic clumping of land uses, as this feature made it possible to efficiently measure sound for many receptors at the same time, due to sound contours, and equivalent distance characteristics.

Field Measurements

The instrument model used to measure noise levels for the analysis was the Brüel &Kjær model 2238 mediator. The calibration was completed by Odin Metrology. Each setup was conducted according to the Traffic Noise Analysis Protocol and Technical Noise Supplement, from 1998. The two instruments are identified as follows: Meter 1 (Serial Number 2231629) and Meter 2 (Serial Number 2231630). Both had been calibrated on January 9, 2003, and are due for their next factory calibration in one year.

The receiver positions were selected based on proximity to the highway and their associated land use. Measurements were conducted for a period of ten(10) to fifteen(15) minutes. Separate setups were done by repositioning the sound measurement device at or near the previous position. Measurements were taken to capture a steady stream of traffic flow. Appendix A records the dates, times of measurement, duration and field calibration information of each measurement.

Average traffic speed during each measurement was clocked by steady driving at greater than 88.5 km/hr (55 mi/hr). For the purposes of modeling, 55 mph was used, and the maximum rate employed by the model (88.5 km/hr) was used. Traffic volume was estimated by the forecast provided in the Project Study Report, approved January 22, 1999. During measurement periods, the observed traffic flow was steady. No breaks in flow were observed which may affect the measurement of sound pressures.

Table 3a: Traffic Forecast (Page 5 of Design Scoping Checklist)

Design Year	ADT	Existing to Future Ratio
Existing	5300	1.0
2010	7370	0.719
2020	8140	0.651
2030	8990	0.5895

Table 3b: Field Counted Traffic

Site	Auto	Medium	Heavy	Speed (mph)	V_E
A.	333	9	32	55	
B.	167	16	57	55	
C.	243	11	54	55	
D.	220	18	73	55	
E.	220	18	73	55	
F.	233	42	45	55	
G.	369	12	82	55	
H.	255	6	65	55	
I.	220	18	73	55	
J.	199	15	40.5	55	
K.	249	5	55	55	
L.	249	5	55	55	
M.	249	5	55	55	

During the sampling period, measurements of relative humidity and temperature could be characterized as mild. The data is summarized in the table below:

Table 4: Meteorological Conditions at the Time of Measurement

Site	Setup	Wind Speed (m/s)	Temperature (F)	Relative Humidity (%)
A	1-1	0	70	50
	1-2	0	70	50
	2-1	0	70	50
	2-2	0	70	50
B	1	0	80	40
	2	0	80	40
C	1	0	80	40
	2	0	80	40
D	1	0	75	45
	2	0	75	45
E	1	0	75	45
	2	0	75	45
F	1	0	75	50
	2	0	75	50
G	1	3-5 NE	80	40
	2	3-5 NE	80	40
H	1	6 NE	80	40
	2	6 NE	80	40
I	1	1-2 S-SW	65	50
	2	1-2 S-SW	65	50
J	1-1	1-2 S-SW	67	50
	1-2	1-2 S-SW	67	50
	2-1	1-2 S-SW	67	50
	2-1	1-2 S-SW	67	50
K	1	0	70	50
	2	0	70	50
L	1	6 S-SW	70	50
	2	4-6 S-SW	70	50
	3	4-6 S-SW	70	50
M	1	0	70	50
	2	0	70	50

According to technical advisory, the Sound 32 model is most accurate for an air temperature of 68 degrees Farenheit (20 degrees C), and a relative humidity between 50% and 70%. Given these constraints, the current alteration would vary by only 1 dB.

Sound 32 was the noise prediction model used to determine the future predicted noise levels at the project site.

EXISTING NOISE ENVIRONMENT

Noise Sensitive Land Uses

Measurement Site	NAC Category	Description
A.	B (67 dBA)	299 S. Pine St., Cartago, CA.
B.	B (67 dBA)	Historic School Site
C.	B (67 dBA)	Olancha School Site
D.	B (67 dBA)	Intersection of Fall and Summer Rd.
E.	B (67 dBA)	425 ft from Highway 395, along Fall Rd.
F.	B (67 dBA)	Corner of Sierra and Whitney St.
G.	B (67 dBA)	503 ft. from Highway 395 in RV Park
H.	B (67 dBA)	185 ft. from Highway 395 in RV Park
I.	B (67 dBA)	Home just north of Shop St., off Fall Rd.
J.	B (67 dBA)	Ranch Motel, Olancha, CA.
K.	B (67 dBA)	301 Olancha Lane, Olancha, CA.
L.	B (67 dBA)	497 Lacey Ave., Olancha, CA.
M.	B (67 dBA)	100 Olancha Lane, Olancha, CA.

These are the measured site locations from the field visit conducted the week of May 5, 2003. There was one modeled location that was not measured. Receptor 40 represents a house owned by the owner of the Crystal Geyser Plant. Personnel of the Crystal Geyser informed us that the owner makes rare and infrequent visits to the home. Since there is no amount of frequent human use, it should not be given consideration for a barrier.

Existing Noise Levels At Receivers

Field measurements were taken according to the procedures described above and are listed in Table 5 below:

TABLE 5. MEASURED NOISE DATA

Setup Location	Receivers Represented	Date	Time of Day (Start Time, Military)	Measurement Period (Seconds)				Measured L_{aeq}
				Run 1	Run 2	Run 3	Run 4	
A	1,2	5/6/03	0800	623	627	779	628	42.9,47.5
B	7,21-25,38-39	5/6/03	0940	686	601			53.0
C	8	5/6/03	0922	664	668			47.2
D	9,10,35-37	5/6/03	1026	900	669			38.9
E	11	5/6/03	1059	629	601			50.5
F	3,17	5/6/03	1318	602	621			55.8
G	15	5/6/03	1414	601	639			51.55
H	16	5/6/03	0910	602	614			59.5
I	12,26-34	5/7/03	1044	602	604			36.1
J	13,14	5/7/03	0910	606	603			56.5
K	5	5/7/03	1044	608	616			38.6
L	4,18,20	5/7/03	1325	603	610	616		42.7
M	6,19	5/7/03	1400	606	627	664	771	38.6

*Measured are averages of field readings; See appendix A for details. The second is the Standard Unit of measure for time.

FUTURE NOISE ENVIRONMENT, IMPACTS, AND CONSIDERED ABATEMENT/MITIGATION

A. Data Assumptions and Site Geometry

Site geometry was determined to be a key factor in the development of the model. Elevations increase as the highway approaches the Sierra Nevadas. For State Route 395, this became an important consideration, and required reasonably accurate elevation information to determine angles and distances that could have an effect on any calculation. The information provided by the purchase of the 3D Microstation Projection of the land area obtained from Los Angeles Water and Power (LAWP) has proven invaluable to the proper determination of such elevations, distances and angles which might not have otherwise been determined. Although much data was not available in that format, USGS quadrangle maps adequately supplied information for lands not owned by LAWP. Background noise levels are assumed to be 36.1 dBA, since this was the lowest reading sampled. Based on available data gathered, it is reasonable to assume that the background noise level ranges from 36 to 41 dBA, depending on wind conditions.

B. Traffic Noise Impacts and Predicted Noise Levels (Noise w/ Barrier)

Traffic noise impacts are expected with the increase in traffic volume over the next 30 years (traffic design year 2033). Changes in the traffic pattern are expected to be more dramatic with the adoption of Alternative 3, as some existing locations will benefit from the resulting reduction, while still others will experience detrimental effects in the form of substantial increases. For each alternative, Table 6 identifies which receivers are expected to receive increases, which are expected to receive decreases, and what form of impact each will have.

C. Noise Abatement Options

Noise abatement options include barriers, and in rare case by case bases, insulation. Insulation can only be installed in the most aggregious instances where the substantial noise increases exceed 30 dBA and the absolute noise level is greater than 75 dBA. Since none of the receptors present this situation (see the following tables) none of the individual receptors would qualify for consideration of insulation. **Outer barriers are the only reasonable option to be considered.**

TABLE 6a. FUTURE PREDICTED NOISE IMPACTS: Alternative 1

Receiver	Development Type	Predate 1978 (Y or N)	NAC and Category	Address	Existing Noise Level (L_{eq}(h))	Predicted Noise Level (Leq(h),20 years) w/o Barrier	Noise Increase or Decrease	Impact Type
1	Residential	Yes	B(67)	299 S. Pine	42.9	56.2	+13.3	S
2	Commercial	Yes	C(72)	Beehive Hut in Front of 299 S. Pine	47.5	60.1	+12.6	S
3	Residential	Yes	B(67)	Sierra and Whitney St.	55.8	56.6	+0.8	None
4	Residential	Yes	B(67)	497 Lacey Lane	42.7	45.7	+3.0	None
5	Residential	Yes	B(67)	301 Olancha Lane	38.65	50.1	+11.4	None
6	Residential	Yes	B(67)	100 Olancha Lane	46.9	51.8	+4.9	None
7	Residential	Yes	B(67)	Old Olancha School House	53	62.4	+9.4	None
8	Residential	Yes	B(67)	Olancha School, Lone Pine School District	47.2	53.5	+6.3	None
9	Residential	Yes	B(67)	Fall St/Summer Road Interchange	38.9	41.3	+2.4	None
10	Residential	Yes	B(67)	Near Fall St./ Summer Rd. Interchange (Near Alternative 3)	38.9	42.5	+3.6	None
11	Residential	Yes	B(67)	Fall St. (Nearby existing SR 395)	50.5	47.7	-2.8	None
12	Residential	Yes	B(67)	Deepest Home off of Williams Road (from Fall St.)	36.1	42.5	+6.4	None
13	Residential	Yes	B(67)	Ranch Motel	49.9	60.7	+10.8	None
14	Residential	Yes	B(67)	Ranch Motel	56.5	56.7	+0.2	None
15	Residential	Yes	B(67)	RV Park (Rear)	51.5	60.7	+9.2	None
16	Residential	Yes	B(67)	RV Park (Front)	59.5	56.0	-3.5	None
17	Residential	Yes	B(67)	Represented by R 3	55.8	65.2	+9.4	None
18	Residential	Yes	B(67)	Represented by R 4	42.7	49.7	+7.0	None
19	Residential	Yes	B(67)	Represented by R 6	46.87	60.3	+13.4	S
20	Residential	Yes	B(67)	Represented by R 4	42.7	44.0	+1.3	None
21	Residential	Yes	B(67)	Represented by R 7	53.0	56.2	+3.2	None
22	Residential	Yes	B(67)	Represented by R 7	53.0	58.8	+5.8	None
23	Residential	Yes	B(67)	Represented by R 7	53.0	58.2	+5.2	None
24	Residential	Yes	B(67)	Represented by R 7	53.0	54.0	1.0	None
25	Residential	Yes	B(67)	Represented by R 7	53.0	51.8	-1.2	None
26	Residential	Yes	B(67)	Represented by R 12	36.1	59.7	+23.6	S
27	Residential	Yes	B(67)	Represented by R 12	36.1	52.8	+16.7	S
28	Residential	Yes	B(67)	Represented by R 12	36.1	47.7	+11.6	None
29	Residential	Yes	B(67)	Represented by R 12	36.1	46.6	+10.5	None
30	Residential	Yes	B(67)	Represented by R 12	36.1	53.7	+17.6	S
31	Residential	Yes	B(67)	Represented by R 12	36.1	51.9	+15.8	S
32	Residential	Yes	B(67)	Represented by R 12	36.1	46.2	+10.1	None
33	Residential	Yes	B(67)	Represented by R 12	36.1	45.2	+9.1	None
34	Residential	Yes	B(67)	Represented by R 12	36.1	49.6	+13.5	S
35	Residential	Yes	B(67)	Represented by R 9	38.9	42.7	+3.8	None
36	Residential	Yes	B(67)	Represented by R 9	38.9	41.0	+2.1	None
37	Residential	Yes	B(67)	Represented by R 9	38.9	40.7	+1.8	None
38	Residential	Yes	B(67)	Represented by R 7	53.0	54.5	+1.5	None
39	Residential	Yes	B(67)	Represented by R 7	53.0	56.3	+3.3	None
40	Residential	Yes	B(67)	Modeled	36.1	49.3	+13.2	S

Impact Type: A/E: Approach or Exceed NAC.; S: Substantial; CR: Class Room Noise; None: No Impact

TABLE 6b. FUTURE PREDICTED NOISE IMPACTS: Alternative 2

Receiver	Development Type	Predate 1978 (Y or N)	NAC and Category	Address	Existing Noise Level (L_{eq}(h))	Predicted Noise Level (Leq(h),20 years) w/o Barrier	Noise Increase or Decrease	Impact Type
1	Residential	Yes	B(67)	299 S. Pine	42.9	48.1	+5.2	None
2	Commercial	Yes	C(72)	Beehive Hut in Front of 299 S. Pine	47.5	48.2	+0.7	None
3	Residential	Yes	B(67)	Sierra and Whitney St.	55.8	51.3	-4.5	None
4	Residential	Yes	B(67)	497 Lacey Lane	42.7	55.1	+12.4	S
5	Residential	Yes	B(67)	301 Olancha Lane	38.65	57.3	+18.7	S
6	Residential	Yes	B(67)	100 Olancha Lane	46.9	59.8	+12.9	S
7	Residential	Yes	B(67)	Old Olancha School House	53	52.2	-0.8	None
8	Residential	Yes	B(67)	Olancha School, Lone Pine School District	47.2	49	+1.8	None
9	Residential	Yes	B(67)	Fall St/Summer Road Interchange	38.9	45.6	+6.7	None
10	Residential	Yes	B(67)	Near Fall St./ Summer Rd. Interchange (Near Alternative 3)	38.9	45.4	+6.5	None
11	Residential	Yes	B(67)	Fall St. (Nearby existing SR 395)	50.5	45.5	-5.0	None
12	Residential	Yes	B(67)	Deepest Home off of Williams Road (from Fall St.)	36.1	43.7	+7.6	None
13	Residential	Yes	B(67)	Ranch Motel	49.9	60.5	+10.6	None
14	Residential	Yes	B(67)	Ranch Motel	56.5	58.8	+2.3	None
15	Residential	Yes	B(67)	RV Park (Rear)	51.5	60.5	+9.0	None
16	Residential	Yes	B(67)	RV Park (Front)	59.5	58.6	-0.9	None
17	Residential	Yes	B(67)	Represented by R 3	55.8	51.3	-4.5	None
18	Residential	Yes	B(67)	Represented by R 4	42.7	55.1	+12.4	S
19	Residential	Yes	B(67)	Represented by R 6	46.87	60.2	+13.33	S
20	Residential	Yes	B(67)	Represented by R 4	42.7	55.1	+12.4	S
21	Residential	Yes	B(67)	Represented by R 7	53.0	52.2	-0.8	None
22	Residential	Yes	B(67)	Represented by R 7	53.0	52.2	-0.8	None
23	Residential	Yes	B(67)	Represented by R 7	53.0	52.2	-0.8	None
24	Residential	Yes	B(67)	Represented by R 7	53.0	52.2	-0.8	None
25	Residential	Yes	B(67)	Represented by R 7	53.0	52.2	-0.8	None
26	Residential	Yes	B(67)	Represented by R 12	36.1	43.7	+7.6	None
27	Residential	Yes	B(67)	Represented by R 12	36.1	43.7	+7.6	None
28	Residential	Yes	B(67)	Represented by R 12	36.1	43.7	+7.6	None
29	Residential	Yes	B(67)	Represented by R 12	36.1	43.7	+7.6	None
30	Residential	Yes	B(67)	Represented by R 12	36.1	43.7	+7.6	None
31	Residential	Yes	B(67)	Represented by R 12	36.1	43.7	+7.6	None
32	Residential	Yes	B(67)	Represented by R 12	36.1	43.7	+7.6	None
33	Residential	Yes	B(67)	Represented by R 12	36.1	43.7	+7.6	None
34	Residential	Yes	B(67)	Represented by R 12	36.1	43.7	+7.6	None
35	Residential	Yes	B(67)	Represented by R 9	38.9	45.6	+6.7	None
36	Residential	Yes	B(67)	Represented by R 9	38.9	45.6	+6.7	None
37	Residential	Yes	B(67)	Represented by R 9	38.9	45.6	+6.7	None
38	Residential	Yes	B(67)	Represented by R 7	53.0	52.2	-0.8	None
39	Residential	Yes	B(67)	Represented by R 7	53.0	52.2	-0.8	None
40	Residential	Yes	B(67)	Modeled	36.1	57.5	+21.4	S

Impact Type: A/E: Approach or Exceed NAC.; S: Substantial; CR: Class Room Noise; None: No Impact

TABLE 6c. FUTURE PREDICTED NOISE IMPACTS: Alternative 3

Receiver	Development Type	Predate 1978 (Y or N)	Noise Abatement Criteria and Category	Address	Existing Noise Level (L_{eq}(h))	Predicted Noise Level (Leq(h),20 years) w/o Barrier	Noise Increase or Decrease	Impact Type
1	Residential	Yes	B(67)	299 S. Pine	42.9	56.5	+13.6	S
2	Commercial	Yes	C(72)	Beehive Hut in Front of 299 S. Pine	47.5	62.3	+14.8	S
3	Residential	Yes	B(67)	Sierra and Whitney St.	55.8	55.3	-0.5	None
4	Residential	Yes	B(67)	497 Lacey Lane	42.7	46.4	+3.7	None
5	Residential	Yes	B(67)	301 Olancha Lane	38.7	41.7	+3.0	None
6	Residential	Yes	B(67)	100 Olancha Lane	46.9	40.2	-6.7	None
7	Residential	Yes	B(67)	Old Olancha School House	53	37.6	-15.4	None
8	Residential	Yes	B(67)	Olancha School, Lone Pine School District	47.2	38.7	-8.5	None
9	Residential	Yes	B(67)	Fall St/Summer Road Interchange	38.9	54.1	+15.2	S
10	Residential	Yes	B(67)	Near Fall St./ Summer Rd. Interchange (Near Alternative 3)	38.9	49.1	+10.2	None
11	Residential	Yes	B(67)	Fall St. (Nearby existing SR 395)	50.5	40.6	-9.9	None
12	Residential	Yes	B(67)	Deepest Home off of Williams Road (from Fall St.)	36.1	39.3	+3.2	None
13	Residential	Yes	B(67)	Ranch Motel	49.9	48.3	-1.6	None
14	Residential	Yes	B(67)	Ranch Motel	56.5	49.7	+6.8	None
15	Residential	Yes	B(67)	RV Park (Rear)	51.5	53.1	+1.6	None
16	Residential	Yes	B(67)	RV Park (Front)	59.5	56.6	+2.9	None
17	Residential	Yes	B(67)	Represented by R 3	55.8	59.3	+3.5	None
18	Residential	Yes	B(67)	Represented by R 4	42.7	42.8	+0.1	None
19	Residential	Yes	B(67)	Represented by R 6	46.87	39.6	-7.3	None
20	Residential	Yes	B(67)	Represented by R 4	42.7	47.7	+5.0	None
21	Residential	Yes	B(67)	Represented by R 7	53.0	38.3	-14.7	None
22	Residential	Yes	B(67)	Represented by R 7	53.0	37.9	-15.1	None
23	Residential	Yes	B(67)	Represented by R 7	53.0	38.0	-15	None
24	Residential	Yes	B(67)	Represented by R 7	53.0	38.2	-14.8	None
25	Residential	Yes	B(67)	Represented by R 7	53.0	38.4	-14.6	None
26	Residential	Yes	B(67)	Represented by R 12	36.1	36.0	-0.1	None
27	Residential	Yes	B(67)	Represented by R 12	36.1	37.6	+1.5	None
28	Residential	Yes	B(67)	Represented by R 12	36.1	39.1	+3.0	None
29	Residential	Yes	B(67)	Represented by R 12	36.1	39.0	+2.9	None
30	Residential	Yes	B(67)	Represented by R 12	36.1	34.1	-2.0	None
31	Residential	Yes	B(67)	Represented by R 12	36.1	35.4	-0.7	None
32	Residential	Yes	B(67)	Represented by R 12	36.1	37.9	+1.8	None
33	Residential	Yes	B(67)	Represented by R 12	36.1	36.7	+0.6	None
34	Residential	Yes	B(67)	Represented by R 12	36.1	34.1	-2.0	None
35	Residential	Yes	B(67)	Represented by R 9	38.9	47.5	+8.6	None
36	Residential	Yes	B(67)	Represented by R 9	38.9	54.5	+15.6	S
37	Residential	Yes	B(67)	Represented by R 9	38.9	56.6	+17.7	S
38	Residential	Yes	B(67)	Represented by R 7	53.0	38.6	-14.4	None
39	Residential	Yes	B(67)	Represented by R 7	53.0	38.2	-14.8	None
40	Residential	Yes	B(67)	Modeled	36.1	48.7	+12.6	S

Impact Type: A/E: Approach or Exceed NAC.; S: Substantial; CR: Class Room Noise; None: No Impact

Table 6d. Summary of Noise Impacts and Increases by Alternative

Receptor	Existing Sound Pressure Level (Noise Level)	Alternative 1 Noise Increase	Alternative 2 Noise Increase	Alternative 3 Noise Increase	Criteria for a Substantial Increase (dBA)	*Impact Determination Receptor location and Alternative	Number of Alternatives that have a Substantial Increase in this Compilation	Alternative most likely to maintain or improve existing conditions
1	42.9	+13.3	+5.2	+13.6	12	S	2	2
2	47.5	+12.6	+0.7	+14.8	12	S	2	2
3	55.8	+0.8	-4.5	-0.5	12	None	0	2
4	42.7	+3.0	+12.4	+3.7	12	S	1	1
5	38.7	+11.4	+18.7	+3.0	12	S	1	3
6	46.9	+4.9	+12.9	-6.7	12	S	1	3
7	53	+9.4	-0.8	-15.4	12	None	0	3
8	47.2	+6.3	+1.8	-8.5	12	None	0	3
9	38.9	+2.4	+6.7	+15.2	12	S	1	1
10	38.9	+3.6	+6.5	+10.2	12	None	0	1
11	50.5	-2.8	-5.0	-9.9	12	None	0	3
12	36.1	+6.4	+7.6	+3.2	12	None	0	3
13	49.9	+10.8	+10.6	-1.6	12	None	0	3
14	56.5	+0.2	+2.3	+6.8	12	None	0	1
15	51.5	+9.2	+9.0	+1.6	12	None	0	3
16	59.5	-3.5	-0.9	+2.9	12	None	0	1
17	55.8	+9.4	-4.5	+3.5	12	None	0	2
18	42.7	+7.0	+12.4	+0.1	12	None	0	3
19	46.87	+13.4	+13.33	-7.3	12	S	2	3
20	42.7	+1.3	+12.4	+5.0	12	S	1	1
21	53.0	+3.2	-0.8	-14.7	12	None	0	2
22	53.0	+5.8	-0.8	-15.1	12	None	0	2
23	53.0	+5.2	-0.8	-15	12	None	0	2
24	53.0	1.0	-0.8	-14.8	12	None	0	2
25	53.0	-1.2	-0.8	-14.6	12	None	0	2
26	36.1	+23.6	+7.6	-0.1	12	S	1	3
27	36.1	+16.7	+7.6	+1.5	12	S	1	3
28	36.1	+11.6	+7.6	+3.0	12	None	0	3
29	36.1	+10.5	+7.6	+2.9	12	None	0	3
30	36.1	+17.6	+7.6	-2.0	12	S	1	3
31	36.1	+15.8	+7.6	-0.7	12	S	1	3
32	36.1	+10.1	+7.6	+1.8	12	None	0	3
33	36.1	+9.1	+7.6	+0.6	12	None	0	3
34	36.1	+13.5	+7.6	-2.0	12	None	0	3
35	38.9	+3.8	+6.7	+8.6	12	None	0	1
36	38.9	+2.1	+6.7	+15.6	12	S	1	1
37	38.9	+1.8	+6.7	+17.7	12	S	1	1
38	53.0	+1.5	-0.8	-14.4	12	None	0	2
39	53.0	+3.3	-0.8	-14.8	12	None	0	2
40	36.1	+13.2	+21.4	+12.6	12	S	3	3

* Using a logical operator known as (OR), if the particular receptor had a substantial increase in noise from any of the three alternatives, then a Substantial designation is assigned. Does not play a role in barrier determination for the individual alternative as there may only be a single alternative for which the condition is substantial.

\- Impacts considered to be Approaching or Exceeding the federal NAC did not exist for any of the 40 potential receivers.

Table 6e: Summary Alternatives and their Individual Potential to Maintain or Improve the Noise Environment

	Alternative 1	Alternative 2	Alternative 3
Number of Receivers that Maintain or Improve Noise Levels	9	11	20

This table is meant to indicate that there would be a greater public benefit to Alternative 3 in terms of the effects of noise because a greater number of receptors might receive a lower dosage of sound pressure than from any other alternative considered. .Although this could be the result of weighted averaging, standard deviations of the limited data may be far from conclusive. This analysis depends on the current land uses remaining constant. In the event of land uses shifting, the conditions may be altered such that an additional comparison of this nature be required to determine which alternative may be preferred over another.

FUTURE NOISE LEVELS AND INSERTION LOSSES

Table 7a: Sound Barriers, Alt 1, No. 1:

Receiver	No. of Benefited Receivers	FUTURE PREDICTED NOISE LEVEL	BARRIER NO.	HEIGHT OF BARRIER												BARRIER LENGTH (M)
				1.8	**I.L.**	2.4	**I.L.**	3.0	**I.L.**	3.6	**I.L.**	4.3	**I.L.**	4.9	**I.L.**	
1	2	56.2	1A	51.6	**4.6**	51.5	**4.7**	51.4	**4.8**	51.4	**4.8**	51.4	**4.8**	51.3	**4.8**	21.0
2	2	60.1	1A	50.1	**10**	49.7	**10.4**	49.4	**10.7**	49.2	**10.9**	49.0	**11.1**	48.9	**11.2**	

IL: Insertion Loss

Table 7b: Sound Barriers, Alt 1, No. 2:

Receiver	No. of Benefited Receivers	FUTURE PREDICTED NOISE LEVEL	BARRIER NO.	HEIGHT OF BARRIER												BARRIER LENGTH (M)
				1.8	**I.L.**	2.4	**I.L.**	3.0	**I.L.**	3.6	**I.L.**	4.3	**I.L.**	4.9	**I.L.**	
19	1	60.3	1B	54.6	**5.7**	53.3	**7.0**	52.1	**8.2**	51.2	**9.1**	50.4	**9.9**	49.7	**10.6**	18.9

IL: Insertion Loss

Table 7c: Sound Barriers, Alt 2, No. 1:

Receiver	No. of Benefited Receivers	FUTURE PREDICTED NOISE LEVEL	BARRIER NO.	HEIGHT OF BARRIER												BARRIER LENGTH (M)
				1.8	**I.L.**	2.4	**I.L.**	3.0	**I.L.**	3.6	**I.L.**	4.3	**I.L.**	4.9	**I.L.**	
4	3	55.1	2A	54.4	**0.7**	54.4	**0.7**	54.4	**0.7**	54.4	**0.7**	54.4	**0.7**	54.4	**0.7**	12.4
5	3	57.3	2A	57.0	**0.3**	57.0	**0.3**	57.0	**0.3**	57.0	**0.3**	57.0	**0.3**	57.0	**0.3**	
6	3	59.8	2A	59.8	**0.0**	59.8	**0.0**	59.8	**0.0**	59.8	**0.0**	59.8	**0.0**	59.8	**0.0**	

IL: Insertion Loss

Table 7d: Sound Barriers, Alt 2, No. 2:

Receiver	No. of Benefited Receivers	FUTURE PREDICTED NOISE LEVEL	BARRIER NO.	HEIGHT OF BARRIER												BARRIER LENGTH (M)
				1.8	**I.L.**	2.4	**I.L.**	3.0	**I.L.**	3.6	**I.L.**	4.3	**I.L.**	4.9	**I.L.**	
18	3	55.1	2B	54.0	**1.1**	54.0	**1.1**	54.0	**1.1**	54.0	**1.1**	54.0	**1.1**	54.0	**1.1**	92.4
19	3	60.2	2B	60.2	**0.0**	60.2	**0.0**	60.0	**0.0**	60.0	**0.0**	60.0	**0.0**	60.0	**0.0**	
20	3	42.7	2B	42.2	**0.5**	42.5	**0.5**	42.5	**0.5**	42.5	**0.5**	42.5	**0.5**	42.5	**0.5**	

IL: Insertion Loss

Table 7e: Sound Barriers, Alt 3, No. 1:

Receiver	No. of Benefited Receivers	FUTURE PREDICTED NOISE LEVEL	BARRIER NO.	HEIGHT OF BARRIER												BARRIER LENGTH (M)
				1.8	**I.L.**	2.4	**I.L.**	3.0	**I.L.**	3.6	**I.L.**	4.3	**I.L.**	4.9	**I.L.**	
1	2	56.5	3A	51.7	**4.8**	51.6	**4.9**	51.6	**4.9**	51.6	**4.9**	51.6	**4.9**	51.6	**4.9**	21.0
2	2	62.3	3A	51.0	**11.3**	50.8	**11.5**	50.7	**11.6**	50.7	**11.6**	50.7	**11.6**	50.7	**11.6**	

IL: Insertion Loss

Table 7f: Sound Barriers, Alt 3, No. 2:

Receiver	No. of Benefited Receivers	FUTURE PREDICTED NOISE LEVEL	BARRIER NO.	HEIGHT OF BARRIER												BARRIER LENGTH (M)
				1.8	**I.L.**	2.4	**I.L.**	3.0	**I.L.**	3.6	**I.L.**	4.3	**I.L.**	4.9	**I.L.**	
9	1	54.1	3B	54.1	**0.0**	54.1	**0.0**	54.1	**0.0**	54.1	**0.0**	54.1	**0.0**	54.1	**0.0**	13.7

IL: Insertion Loss

Table 7i: Sound Barriers, Alt 3, No. 3:

Receiver	No. of Benefited Receivers	FUTURE PREDICTE D NOISE LEVEL	BARRIER NO.	HEIGHT OF BARRIER												BARRIER LENGTH (M)
				1.8	**I.L.**	2.4	**I.L.**	3.0	**I.L.**	3.6	**I.L.**	4.3	**I.L.**	4.9	**I.L.**	
36	2	54.5	3C	54.5	**0.0**	54.5	**0.0**	54.5	**0.0**	54.5	**0.0**	54.5	**0.0**	54.5	**0.0**	28.1
37	2	56.6	3C	56.6	**0.0**	56.6	**0.0**	56.6	**0.0**	56.6	**0.0**	56.6	**0.0**	56.6	**0.0**	

IL: Insertion Loss

PRELIMINARY REASONABLENESS SUMMARY

Table 8a: Projected Allowance per Receiver at the Minimum Feasible Height: Alternative 1

Receiver	**Absolute Noise Level**	**Build (Alternative 1) vs. Existing Noise Level**	**Achievable Noise Reduction of Minimum Feasible Height**	**Allowance per Benefited Receiver**	**Protected Receivers**	**Total Allowance**	**Area of Frequent Human Use**
1	42.9	13.3	NOT FEASIBLE				Yes
2	47.5	12.6	10	$29,000	2	$58,000	No
19	46.88	13.4	5.7	$27,000	1	$27,000	Yes

See Appendix H for Worksheet A calculation.

Table 8b: Projected Allowance per Receiver at the Minimum Feasible Height: Alternative 2

Receiver	Absolute Noise Level	Build (Alternative 2) vs. Existing Noise Level	Achievable Noise Reduction of Minimum Feasible Height	Area of Frequent Human Use
4	42.7	12.4	NOT FEASIBLE	Yes
5	38.65	18.7	NOT FEASIBLE	Yes
6	46.87	12.9	NOT FEASIBLE	Yes
18	42.7	12.4	NOT FEASIBLE	Yes
19	46.88	13.3	NOT FEASIBLE	Yes
20	42.7	12.4	NOT FEASIBLE	Yes

Table 8c: Projected Allowance per Receiver at the Minimum Feasible Height: Alternative 3

Receiver	Absolute Noise Level	Build (Alternative 3) vs. Existing Noise Level	Achievable Noise Reduction of Minimum Feasible Height	Allowance per Benefited Receiver	Number of Protected Receivers	Total Allowance	Area of Frequent Human Use
1	42.9	13.6	NOT FEASIBLE				Yes
2	47.5	14.8	11.3	$29,000	2	$58,000	No
9	38.9	15.2	NOT FEASIBLE				Yes
36	38.9	15.6	NOT FEASIBLE				Yes
37	38.9	17.7	NOT FEASIBLE				Yes

Reasonable expenses for the project regarding Receiver 2 for either Alternative 1 or Alternative 3 total $58,000. This structure however is identified as a commercial structure used to produce honey. The impact abated is that of a substantial increase. Human exposure to the substantial noise increase may be minimal due to the infrequency of visitation to the site. Therefore it is considered unreasonable to construct a barrier at receiver location 2, as it is not an area of frequent human congregation.

Receiver location 19 is a residential receiver that has only demonstrated a feasibility for Alternative 1, at a beneficial allowance of $27,000. However to achieve this result the barrier would need to be an excessive length greater than 300 feet, and would not result in being cost efficient at $15/m^2 vs. a minimum cost of $415.00/m^2 (from cost index 2001).
Hence forth, none of the proposed barriers are feasible or reasonable and no barriers are recommended for construction.

CONSTRUCTION NOISE

Construction activities associated with the project could include the clearing of vegetation, relocation of utilities, the removal of existing barriers, and the construction of noise barriers. Highway construction activities do not typically stay in one location for long periods. Noise sensitive receivers in a given location would not be exposed to noise generated by construction for extended periods. Noise generated by construction equipment typically drops off at a rate of 6 dBA per doubling distance. Table 9 gives some typical values for commonly used construction equipment.

Additional sources of construction noise may also result and should not exceed a maximum of 86 dBA from any one source, at a distance of 15 meters (49.2 feet).

Table 9: Construction Equipment Noise

Types of Construction Equipment	Maximum Level, dBA at 15 m
Impact Pile Driver	95-105
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic tools	85
Concrete Pump	82

CONCLUSION

This project presents four alternatives, including a no-build alternative. This project will result in substantial noise increases for each new alignment alternative presented. The severity of each depends greatly on the relative position between the new alternative and the existing potential receivers. The fewest number of substantial increases in traffic noise occurs with alternative 1 and the most substantial noise increases occur using alternative 2. Although none of these required mitigation action, abatement was considered based on the substantial noise increases. No impacts were considered as resulting from the approaching or exceeding of federal noise abatement criteria. The analysis concluded that although these were credible impacts, that many of the sites were not feasible or reasonable to abate using the sanctioned Sound 32 model and other criteria for reasonableness.

REFERENCES

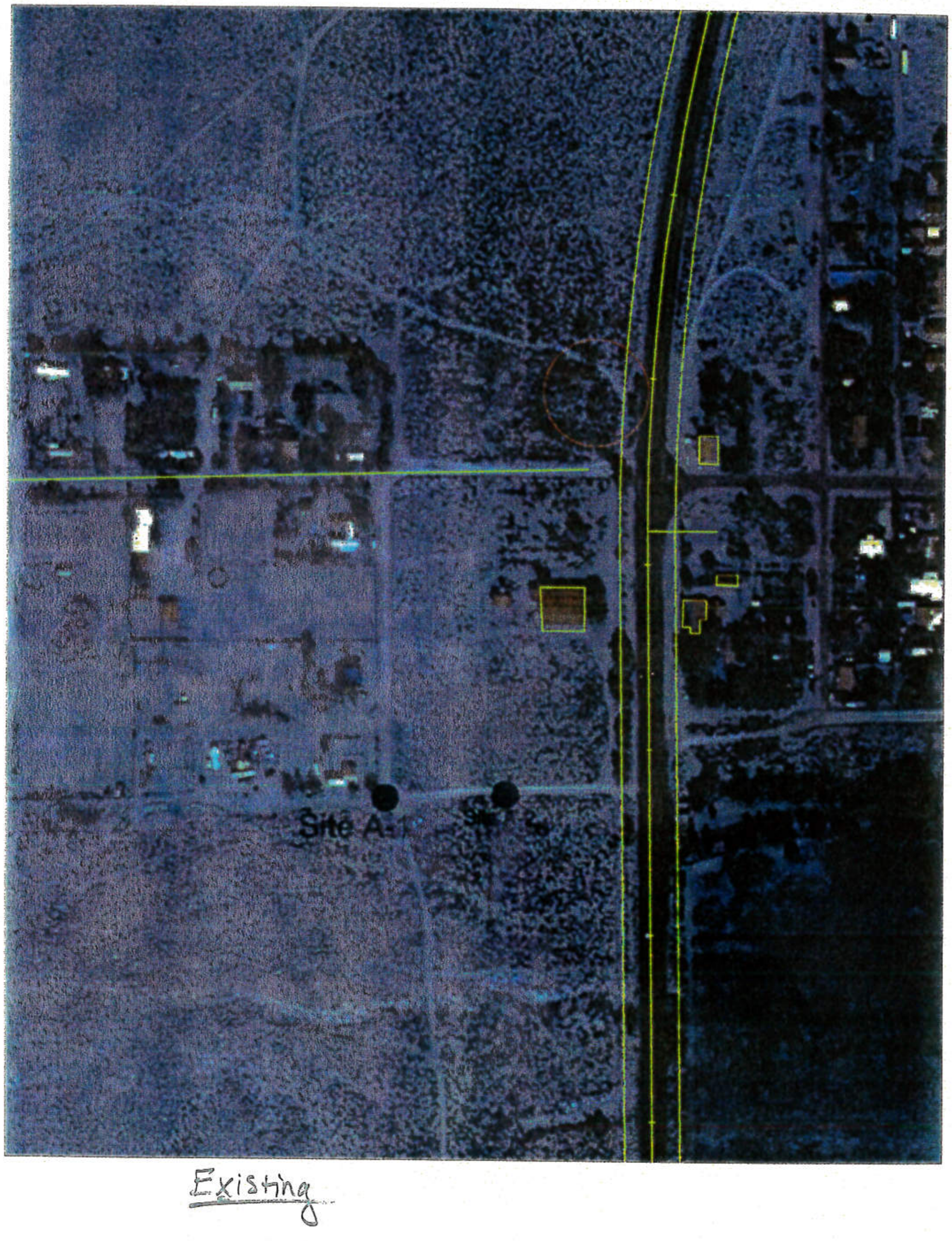
AIHA, 1986. American Industrial Hygiene Association. Noise and Hearing Conservation Manual, Fourth Ed.

California Department of Transportation Environmental Program Environmental Engineering-Noise, Air Quality, and Hazardous Waste Management Office 1998. Traffic Noise Analysis Protocol: For New Highway Construction and Reconstruction Projects

California Department of Transportation Environmental Program Environmental Engineering-Noise, Air Quality, and Hazardous Waste Management Office 1998. Technical Noise Supplement: A Technical Supplement to the Traffic Noise Analysis Protocol.

California Department of Transportation 2001 Contract Cost Data. State of California Business, Transportation and Housing Agency 2001. Pg. 167

SITE A

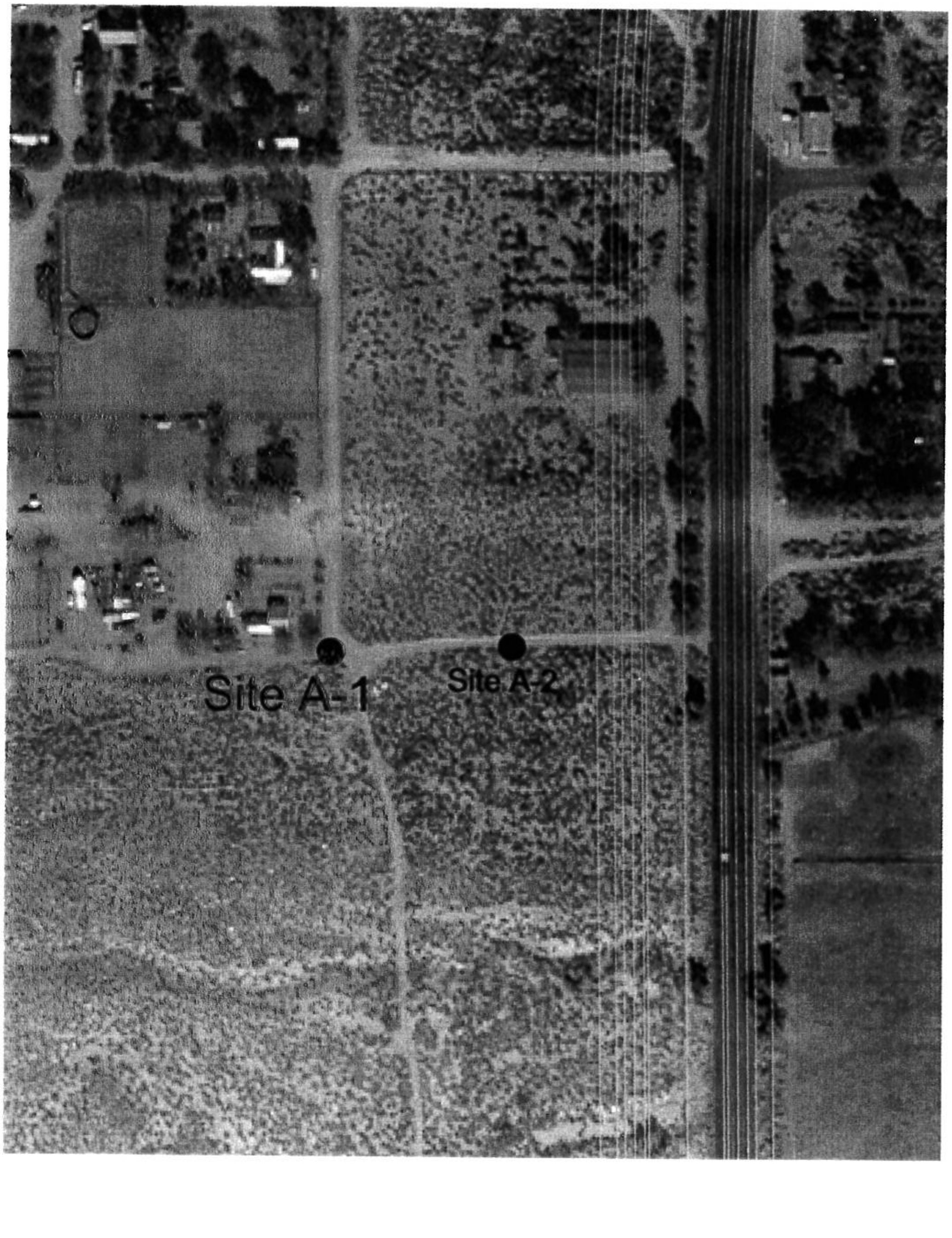


Existing

N

Site A-Alt 1

Site A-Alt 2

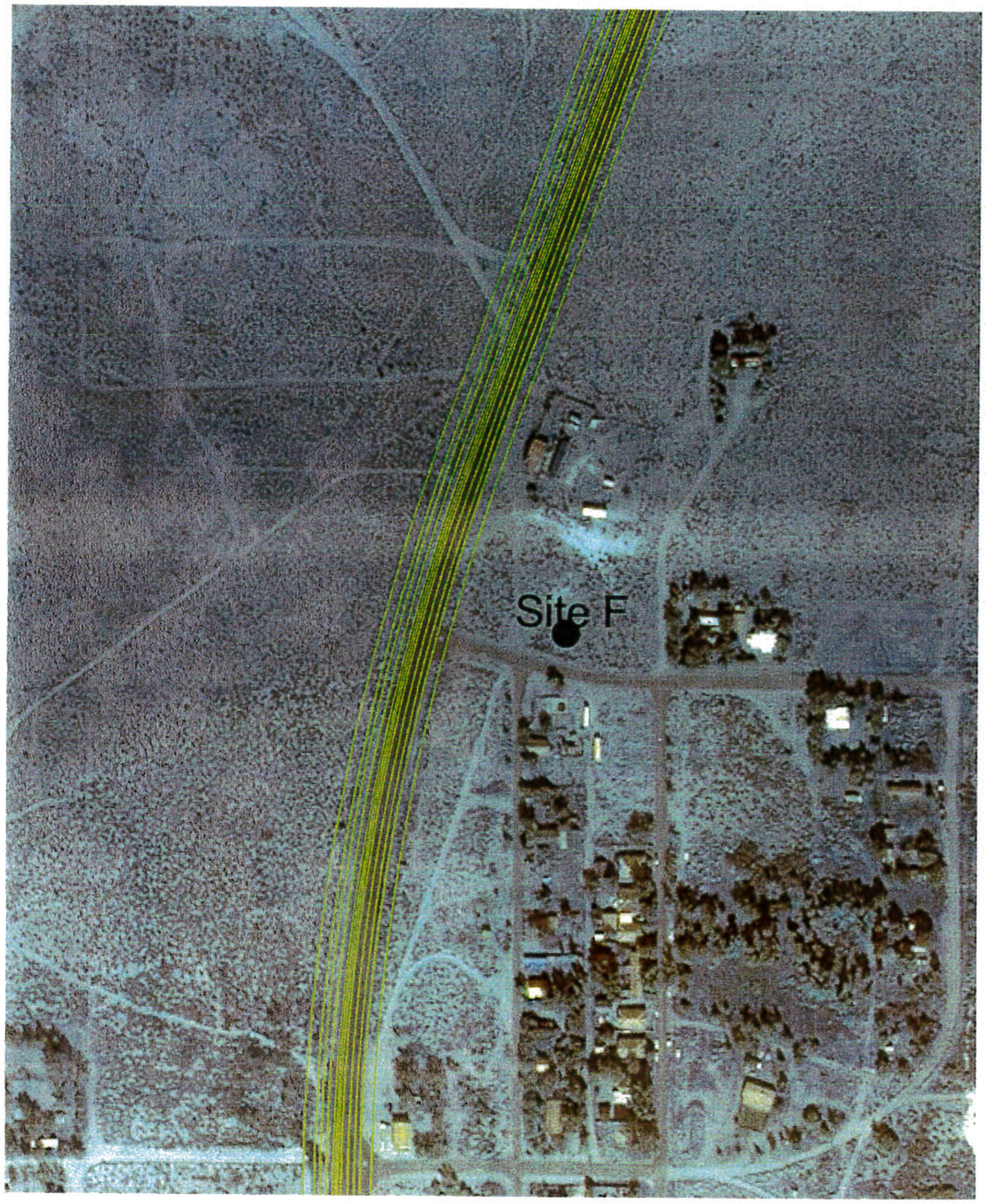


N

Site A-Alt 3

Site F

Site F-Alt 1



Site F-Alt 2

N

Site F-Alt 3

Site L

N

Site L-Alt 1

Site L-Alt 2

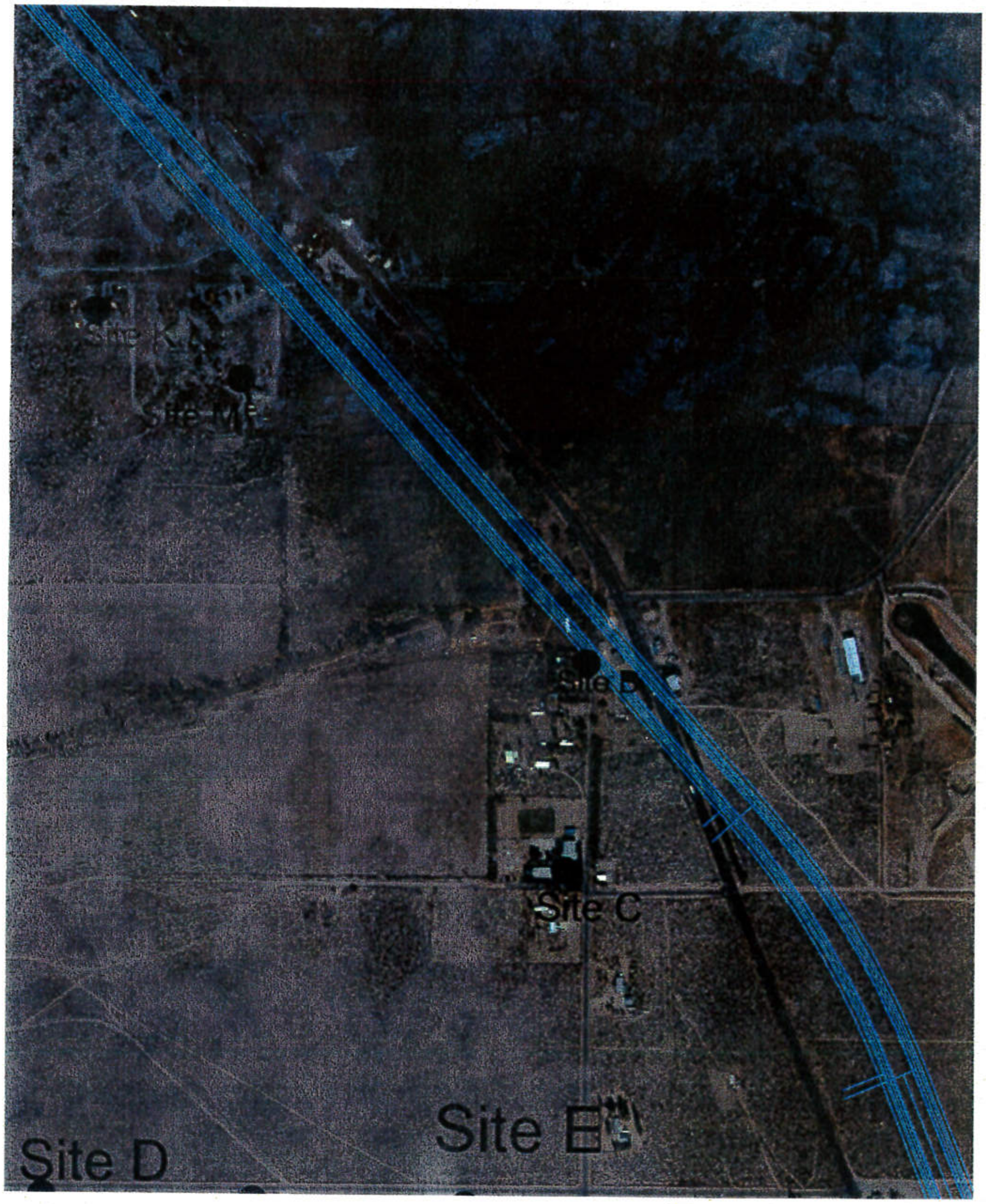
Site L-Alt 3

Site K, M, B, and C

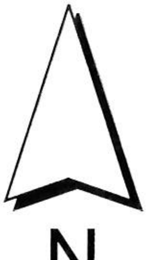
Site K, M, B, and C Alt 1

N

Site K, M, B, and C Alt 2



Site K, M, B, and C Alt 3



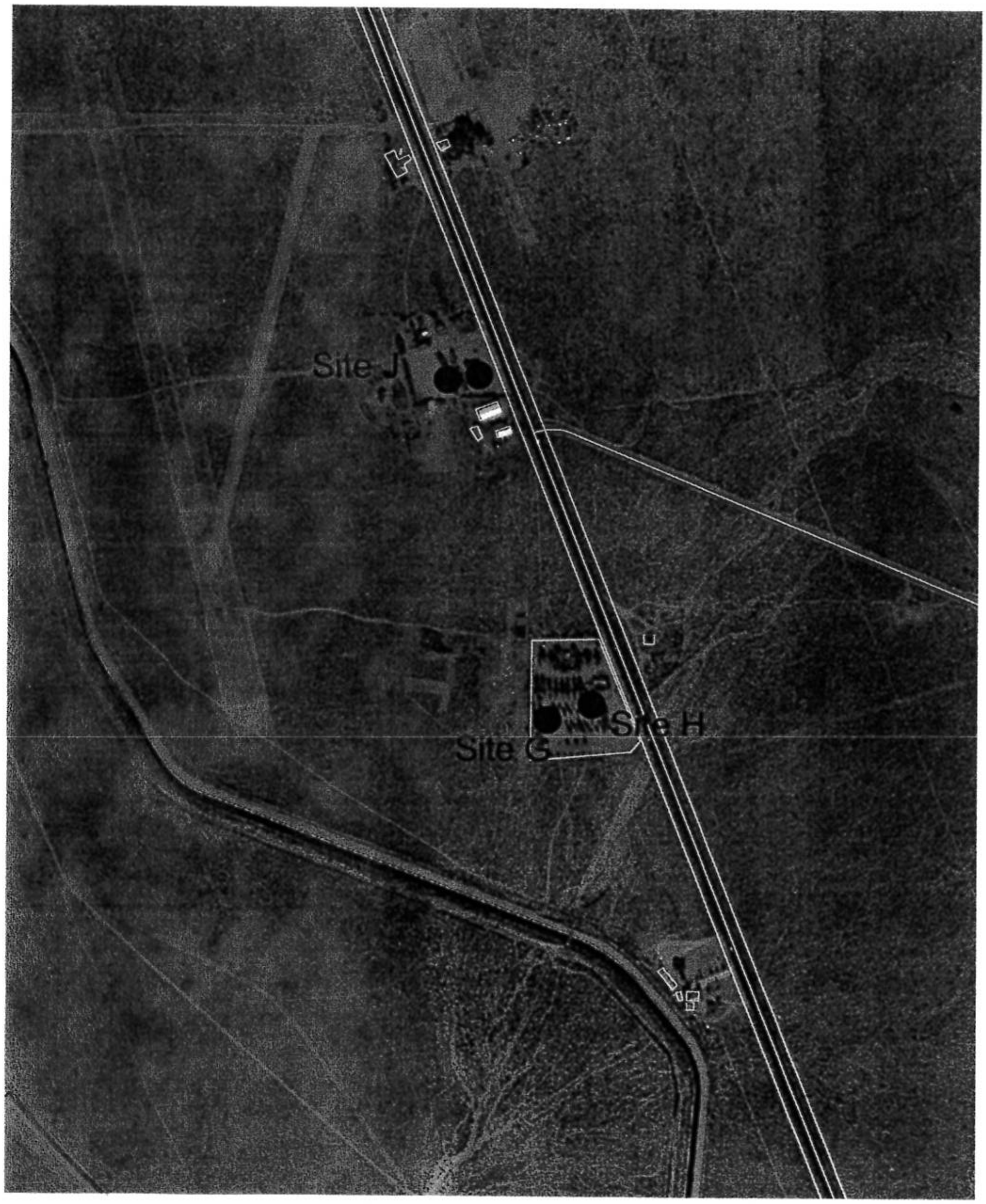
Site D, E, and I

Site D, E, and I Alt 1

Site D, E, and I Alt 2

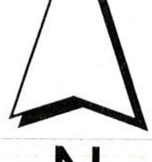
Site D, E, and I Alt 3

Site G, H, and J



Site G, H, and J Alt 1

Site G, H, and J Alt 2



B. PROCEDURE, DURATION, NUMBER OF REPETITIONS

The procedures for this report involved the use of two Bruël & Kjær Mediator 2238 model noise meters. Their serial numbers and factory calibration dates by Odin Metrology are as follows:

1. 2231629 January 29, 2002
2. 2231630 January 29, 2002
4. 2231641 March 19, 2002

Duration was determined in the field and was chosen on the basis of apparent traffic volume. Some traffic volumes could not be counted due to the lack of visibility in some instances.

Measurement Procedure

Below is a procedure list, which was followed in every case. This procedure is consistent with the Traffic Noise Analysis Protocol and Traffic Noise Supplement, issued in October 1998.

1. Place meter and tripod assembly in desired measurement location.
2. Calibrate meter using Calibrator Type 4231 manufactured by Bruël & Kjær, ensuring that the meter is placed in a vertical position in relation to ground. Record result.
3. Reposition meter such that it is perpendicular to the intended source at a height of 1.54m (5 feet).
4. Measure and record the distance from Edge of Traveled Way (ETW) to the meter.
5. Set Thermometer and Relative Humidity Meter in a preferably shaded area nearby the meter, to determine meteorological factors. Record Result.
6. Set wind meter on a Tripod at equal height to the meter and monitor its readings while taking measurements. Periodically note the wind speed. If the wind speed is greater than 5 m/s, cease measurements and wait for calmer weather. Record result of average wind speed.
7. Measure the apparent noise levels by pushing “Play/Pause” on the meter. Push again when finished. Interrupt or pause when non-target noise sources such as barking dogs, aircraft, and other potential unavoidable field occurrences may contaminate readings.
8. When individual reading for the single setup is completed press “Play/Pause” on the meter once more. Press “Save File” and note the file number, L_{Aeq} for later reference.
9. Repeat steps 7-8 for each successive measurement at one single setup. Measurements should be repeated at least twice with the same meter. If the two initial measurements do not agree within two decibels (2 dB), conduct additional measurements until the mean difference between all measurements is within 2 dB.
10. Repeat steps 1 through 8 for each successive setup with the same meter. For example, if measurements are complete, and the tripod is to be moved, then a new setup is constituted and the above procedure should be repeated.

Duration
According to the Traffic Noise Supplement (TeNS 1998), the duration of measurement should be determined based on the traffic count observed at the time of measurement. Below is the table of recommended lengths and traffic volumes.

Table C.1: Table N-3320.1 (TeNS 1998),

Traffic Volume	Vehicle/Hour/Lane	Duration (Minutes)
High	>1000	10
Medium	500-1000	15-20
Low	<500	20-30

*Source: Technical Noise Supplement, Page N-68.

According to the recorded field traffic counts, a measurement period of 20-30 minutes is warranted. Since no source was recorded in the case of background measurements all background measurements were taken in 10-20 minute increments in the interest of time. Background is identified as the ambient noise level without a traffic source, and is used to compare the difference between an existing condition without a highway source to the case of the introduction of a highway source.(see Table A.1).

Repetitions
According to the procedure, each measurement at each setup was conducted at least twice. This was done for the purpose of averaging according to technical guidance contained within TeNS. The result of this was a set of data that contained 4 individual measurements from 2 different setups or measurement units. Each repetition was conducted with the same duration period.

Procedure for Adjustment of Other than Noisiest Hour Traffic to Peak Noise Hour

1. Take noise measurements and count traffic simultaneously during each measurement. Although lane-by-lane traffic counts yield the most accurate results it is usually sufficient to count traffic by direction (e.g. east bound and west bound). Separate vehicles in the three vehicle groups used by the model (autos, medium trucks, and heavy trucks). Obtain average traffic speeds (both directions). These may be obtained by radar or by driving a test vehicle through the project area at the prevailing traffic speed.
2. Expand vehicle counts for the measurement period to hourly values: i.e., if the measurement period was 15 minutes, multiply the vehicles counted in each group by 4. (Section N-3320 discusses duration of measurement as a function of hourly vehicle volumes).
3. Input the hourly traffic volumes and speeds in the Highway Traffic Noise Prediction Model. Also include the proper roadway/receiver geometry and site parameters. Run Model.
4. Input the traffic volumes and speeds associated with the noisiest hour and the same roadway/receiver geometry and site parameters as used in step 3. Run Model.
5. Subtract results of step 3 from those of step 4. Step 4 always should be larger than step 3).
6. Add the differences obtained in step 5 to the noise measurements of step 1.

C. Sound 32 Model Inputs and Outputs

```
**** Sound 2000 (Caltrans Version of
Stamina2/Optima) ****


INPUT DATA FILE : F:\Projects\District
9\Inyo\213400\text files\alt 1-finished\alt1B.txt
DATE            : 7/24/03

ALTERNATIVE 1

===================================================
====================
TRAFFIC DATA

LANE        AUTO       MEDIUM TRKS    HEAVY TRKS
 NO.      VPH  MPH       VPH  MPH       VPH  MPH
DESCRIPTION
---------------------------------------------------
--------------------
   1      369   55        42   55        82   55
   2      369   55        42   55        82   55
   3      369   55        42   55        82   55
   4      369   55        42   55        82   55
   5      369   55        42   55        82   55
   6      369   55        42   55        82   55
   7      369   55        42   55        82   55
   8      369   55        42   55        82   55
   9      369   55        42   55        82   55
   10     369   55        42   55        82   55
   11     369   55        42   55        82   55
   12     369   55        42   55        82   55
===================================================
====================
```

```
LANE DATA

LANE SEG. GRADE
SEGMENT       LANE
 NO.  NO. COR.        X             Y         Z
DESCRIPTION   DESCRIPTION
---------------------------------------------------
--------------------
   1   1  Y        6849057.7    2022131.0  3666.3
1             1
       2  Y        6849051.2    2021879.0  3681.1
2
       3  Y        6849051.2    2021587.0  3681.1
3
       4  Y        6849176.5    2016267.0  3681.1
4
       5  Y        6849187.0    2015964.0  3681.1
5
       6  Y        6849198.8    2015370.0  3686.0
6
       7  Y        6849239.2    2014209.0  3671.3
7
       8  Y        6849248.0    2014040.0  3671.3
8
       9  Y        6849244.8    2013865.0  3671.3
9
                   6849211.3    2013269.0  3661.4
10
   2   1  Y        6849179.5    2012899.0  3656.5
11            2
       2  Y        6849112.9    2012669.0  3651.6
12
       3  Y        6848943.6    2012178.0  3656.5
13
```

		4	Y		6848883.9	2011963.0	3641.7
14							
		5	Y		6848868.4	2011581.0	3631.9
15							
		6	Y		6848907.2	2011139.0	3622.0
16							
		7	Y		6848973.1	2010921.0	3631.9
17							
		8	Y		6849058.4	2010519.0	3631.9
18							
		9	Y		6849088.9	2010278.0	3636.8
19							
					6849135.8	2010051.0	3641.7
20							
	3	1	Y		6849200.5	2009659.0	3651.6
21				3			
		2	Y		6849246.4	2009445.0	3651.6
22							
		3	Y		6849264.1	2009321.0	3661.4
23							
		4	Y		6849280.5	2009208.0	3661.4
24							
		5	Y		6849323.5	2008921.0	3681.1
25							
		6	Y		6849404.2	2008485.0	3681.1
26							
		7	Y		6849444.9	2008283.0	3681.1
27							
		8	Y		6849581.0	2007539.0	3678.0
28							
		9	Y		6849621.7	2007244.0	
36780.029							
					6849671.6	2006948.0	
36780.030							
	4	1	Y		6849683.7	2006729.0	3678.0
31				4			
		2	Y		6849701.8	2006216.0	3676.2
32							
		3	Y		6849667.3	2005864.0	3676.2
33							
		4	Y		6849572.8	2005416.0	3676.2
34							
		5	Y		6849543.3	2005194.0	3676.2
35							
		6	Y		6849505.2	2005076.0	3676.2
36							
		7	Y		6849352.4	2004695.0	3676.2
37							
		8	Y		6848753.3	2002953.0	3666.0
38							
		9	Y		6848737.2	2002905.0	3656.5
39							
					6848440.0	2002116.0	3641.7
40							
	5	1	Y		6848343.8	2001554.0	3641.7
41				5			
		2	Y		6848319.9	2000615.0	3638.1
42							
		3	Y		6848319.6	1999437.0	3636.8
43							
		4	Y		6848369.1	1998972.0	3636.8
44							
		5	Y		6848648.6	1998180.0	3636.8
45							
		6	Y		6848647.6	1998171.0	3639.4
46							
		7	Y		6848753.3	1998032.0	3639.4
47							
		8	Y		6848944.6	1997402.0	3639.4
48							
		9	Y		6849407.5	1996134.0	3641.7
49							
					6849560.7	1995720.0	3641.7
50							
	6	1	Y		6849791.3	1995078.0	3641.7
51				6			

52		2	Y		6849841.5	1994961.0	3641.7
53		3	Y		6849965.6	1994632.0	3641.7
54		4	Y		6850057.1	1994386.0	3641.7
55		5	Y		6850145.7	1994167.0	3641.7
56		6	Y		6850183.1	1994007.0	3641.7
57		7	Y		6850365.8	1993549.0	3646.7
58		8	Y		6850484.9	1993176.0	3646.7
59		9	Y		6850601.7	1992938.0	3646.7
60					6850853.7	1992232.0	3646.7
61	7	1	Y	7	6850968.5	1991922.0	3650.0
62		2	Y		6851094.5	1991622.0	3650.0
63		3	Y		6851242.8	1991344.0	3652.6
64		4	Y		6851458.0	1991037.0	3652.6
65		5	Y		6852197.5	1990207.0	3648.0
66		6	Y		6852780.2	1989540.0	3652.6
67		7	Y		6852885.8	1989420.0	3652.6
68		8	Y		6852990.5	1989314.0	3650.3
69		9	Y		6853217.8	1989048.0	3654.2
70					6853422.2	1988825.0	3650.3
71	8	1	Y	8	6853891.1	1988292.0	3650.0
72		2	Y		6854049.2	1988116.0	3650.3
73		3	Y		6854170.9	1987975.0	3650.0
74		4	Y		6854358.6	1987751.0	3650.0
75		5	Y		6854667.3	1987270.0	3650.0
76		6	Y		6854871.4	1986779.0	3650.0
77		7	Y		6855074.5	1986273.0	3650.0
78		8	Y		6855115.5	1986171.0	3650.0
79		9	Y		6855194.6	1985964.0	3650.0
80					6859675.2	1974871.0	3650.0
81	9	1	Y	9	6859708.3	1974788.0	3742.0
82		2	Y		6860098.4	1973771.0	3742.0
83		3	Y		6860327.1	1973193.0	3742.1
84		4	Y		6860480.3	1972822.0	3742.5
85		5	Y		6860544.0	1972664.0	3742.7
86		6	Y		6860590.2	1972548.0	3742.9
87		7	Y		6860706.7	1972259.0	3743.3
88		8	Y		6860761.8	1972122.0	3743.7
89		9	Y		6860821.5	1971972.0	3743.9

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                 6860864.5    1971866.0  3744.3
90
   10  1  Y      6860913.7    1971746.0  3743.9
91           10
       2  Y      6861104.0    1971263.0  3746.0
92
       3  Y      6861192.6    1971042.0  3747.0
93
       4  Y      6861521.3    1970222.0  3747.5
94
       5  Y      6861611.5    1970008.0  3748.0
95
       6  Y      6861712.3    1969714.0  3748.0
96
                 6861757.5    1969578.0  3748.0
97
   11  1  Y      6849790.7    2005834.0  3671.6
98
       2  Y      6850060.4    2006659.0  3659.8
99
       3  Y      6850108.3    2006919.0  3656.5
100
       4  Y      6850148.0    2007233.0  3651.6
101
       5  Y      6850160.1    2007489.0  3651.6
102
       6  Y      6850208.0    2007755.0  3676.2
103
       7  Y      6850143.7    2007944.0  3651.6
104
       8  Y      6850095.1    2008258.0  3636.8
105
       9  Y      6850063.3    2008649.0  3676.2
106
                 6849901.9    2009338.0  3618.8
107
   12  1  Y      6849866.5    2009737.0  3651.6
108          12
       2  Y      6849825.8    2009957.0  3607.3
109
       3  Y      6849768.0    2010278.0  3636.8
110
       4  Y      6849706.4    2010621.0  3636.8
111
       5  Y      6849586.9    2011294.0  3602.4
112
       6  Y      6849539.0    2011615.0  3577.8
113
       7  Y      6849492.8    2011799.0  3587.6
114
       8  Y      6849400.6    2012365.0  3641.7
115
       9  Y      6849315.3    2012633.0  3622.0
116
                 6849263.5    2013358.0  3622.0
117
==================================================
====================

BARRIER DATA


Barrier No.   1    Barrier Description:
Type: Wall Barrier

Height Increment (DELZ) =  2           No. Height
Changes (P)= 3

                                GROUND     TOP
BARRIER
SEG         X          Y          (ZO)      (Z)
HEIGHTS AT ENDS
--------------------------------------------------
--------------------
 1       6848109.0  2001097.0     3667.8   3679.81
*   12
```

```
        6848116.5  2000407.0     3667.8   3679.82
*   12


--------------------------------------------------
--------------------
Barrier No.   2    Barrier Description:
Type: Wall Barrier

Height Increment (DELZ) =  2           No. Height
Changes (P)= 3

                                GROUND     TOP
BARRIER
SEG         X           Y          (ZO)      (Z)
HEIGHTS AT ENDS
--------------------------------------------------
--------------------
 1      6852506.6  1989565.0     3667.8   3679.83
*   12
        6852916.7  1989102.0     3667.8   3679.84
*   12


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====================

RECEIVER DATA


REC
NO.         X           Y         Z         ID
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--------------------
   1     6847866.8  2000575.1  3647.6       A
   2     6848060.7  2000575.1  3657.2       A1
   3     6848765.1  2002020.3  3636.2        F
   4     6850053.1  1990008.5  3678.6       L
   5     6852271.0  1988618.4  3672.9       K
   6     6853009.8  1988311.0  3663.1       M
   7     6854497.0  1987176.2  3661.3       B
   8     6854384.2  1986185.0  3735.2       C
   9     6852076.8  1984763.1  3687.0       D
   10    6852554.5  1984763.1  3687.0       D
   11    6854057.7  1984741.5  3687.0       E
   12    6853550.2  1982247.4  3735.2       I
   13    6858236.2  1977828.7  3731.6       J
   14    6858038.1  1977778.9  3731.6       J
   15    6858870.1  1976279.9  3747.4       G
   16    6858620.4  1976230.3  3747.4       H
   17    6848450.1  2000948.5  3641.1       REC 17
   18    6851259.8  1989597.4  3688.3       REC 18
   19    6852713.9  1989240.2  3668.0       REC 19
   20    6849928.5  1989501.3  3688.3       REC 20
   21    6854339.9  1986844.8  3662.1       B
   22    6854425.2  1987009.8  3662.1       B
   23    6854350.4  1987100.4  3662.1       B
   24    6854632.9  1985670.3  3662.1       B
   25    6854632.9  1985067.9  3662.1       B
   26    6855426.5  1984684.4  3735.2        I
   27    6854899.3  1984684.4  3735.2        I
   28    6854393.0  1983883.2  3735.2        I
   29    6854323.8  1983457.0  3735.2        I
   30    6855724.7  1982871.4  3735.2        I
   31    6855357.0  1983244.4  3735.2        I
   32    6854425.2  1982929.8  3735.2        I
   33    6854425.5  1982266.4  3735.2        I
   34    6855413.7  1982266.4  3735.2        I
   35    6852837.6  1984313.0  3687.0       D
   36    6852304.8  1983881.2  3687.0       D
   37    6852086.6  1984190.3  3687.0       D
   38    6854286.1  1986641.7  3661.4       B
   39    6854392.7  1986737.5  3661.4       B
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```
   40    6859845.8  1971341.9  3755.6
MODELED
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DROP-OFF RATES


 LANE |       RECEIVER NO.
  No. |      1    2    3    4    5    6    7    8
9    10   11   12   13   14   15   16   17   18
19   20   21   22   23   24   25   26   27   28
29   30   31   32   33   34   35   36   37   38
39   40

   1  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   2  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   3  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   4  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   5  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   6  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   7  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   8  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   9  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   10 |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   11 |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   12 |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
```

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**** Sound 2000 (Caltrans Version of
Stamina2/Optima) ****


INPUT DATA FILE : F:\Projects\District
9\Inyo\213400\text files\alt 2
finished\alt2clEnglish.txt
DATE            : 7/24/03

ALTERNATIVE 2 OLANCHA

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=====================
TRAFFIC DATA

LANE        AUTO      MEDIUM TRKS    HEAVY TRKS
 NO.      VPH  MPH      VPH  MPH      VPH  MPH
DESCRIPTION
-----------------------------------------------------
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   1      255   65        6  65        55   65
   2      255   65        6  65        55   65
   3      255   65        6  65        55   65
   4      255   65        6  65        55   65
=====================================================
=====================

LANE DATA

LANE SEG. GRADE
SEGMENT       LANE
 NO.  NO. COR.        X            Y        Z
DESCRIPTION   DESCRIPTION
-----------------------------------------------------
--------------------
```

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   1   1  Y        6849323.8    2012475.0  3694.9
1               1
       2  Y        6849385.8    2011867.0  3694.9
2
       3  Y        6849714.6    2010047.0  3694.9
3
       4  Y        6850043.0    2008226.0  3694.9
4
       5  Y        6850080.7    2007199.0  3694.9
5
       6  Y        6849851.0    2006197.0  3694.9
6
       7  Y        6849171.9    2004317.0  3694.9
7
       8  Y        6848310.4    2001742.0  3694.9
8
       9  Y        6848369.4    1998129.0  3694.9
9
                   6849039.7    1996142.0  3694.9
10
   2   1  Y        6849039.7    1996142.0  3694.9
10             2
       2  Y        6849313.6    1995401.0  3694.9
11
       3  Y        6850169.6    1993100.0  3694.9
12
       4  Y        6850685.4    1991693.0  3672.9
13
       5  Y        6850914.0    1991170.0  3672.9
14
       6  Y        6853098.1    1988559.0  3672.9
15
       7  Y        6855036.4    1986374.0  3647.3
16
                   6855816.2    1985241.0  3669.0
17
   3   1  Y        6855816.2    1985241.0  3669.9
1              3
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2 Y 6855891.4 1985046.0 3669.9
2
3 Y 6856638.4 1983190.0 3669.9
3
4 Y 6856965.5 1982378.0 3669.9
4
5 Y 6857409.7 1981268.0 3669.9
5
6 Y 6859611.5 1975794.0 3695.2
6
7 Y 6859877.9 1975122.0 3695.2
7
8 Y 6860057.6 1974674.0 3695.2
8
9 Y 6860172.2 1974146.0 3695.2
9
6860273.5 1973478.0 3695.2
10
4 1 Y 6860273.5 1973478.0 3695.2
10 4
2 Y 6860425.1 1972592.0 3695.2
11
3 Y 6860569.5 1972185.0 3726.7
12
4 Y 6860779.4 1971655.0 3726.7
13
5 Y 6861253.8 1970486.0 3726.7
14
6 Y 6861785.3 1969166.0 3726.7
15
7 Y 6861461.8 1969969.0 3726.7
16
6862212.8 1968089.0 3726.7
17
==
====================

BARRIER DATA

Barrier No. 1 Barrier Description: BARRIER 1
Type: Wall Barrier

Height Increment (DELZ) = 2 No. Height
Changes (P)= 3

GROUND TOP
BARRIER
SEG X Y (ZO) (Z)
HEIGHTS AT ENDS

----
1 6851667.7 1990090.0 3694.0
3706.0`1 * 12
6851937.7 1989785.0 3694.0 3706.02
* 12

Barrier No. 2 Barrier Description: BARRIER 2
Type: Wall Barrier

Height Increment (DELZ) = 2 No. Height
Changes (P)= 3

GROUND TOP
BARRIER
SEG X Y (ZO) (Z)
HEIGHTS AT ENDS

----
1 6855959.3 1983682.0 3750.7
3760.5B1 P1 * 9.80000000000018
6854821.9 1986492.0 3750.7
3760.5B1 P2 * 9.80000000000018

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RECEIVER DATA

REC NO.	X	Y	Z	ID
1	6847866.8	2000575.1	3699.8	REC 1
2	6848060.7	2000575.1	3699.8	REC 2
3	6848765.1	2002020.3	3699.8	REC 3
4	6850053.1	1990008.5	3672.9	REC 4
5	6852271.0	1988618.4	3653.2	REC 5
6	6853009.8	1988311.0	3653.2	REC 6
7	6854497.0	1987176.2	3660.8	REC 7
8	6854384.2	1986185.0	3660.8	REC 8
9	6852076.8	1984763.1	3769.4	REC 9
10	6852554.5	1984763.1	3763.1	REC 10
11	6854057.7	1984741.5	3756.6	REC 11
12	6853550.2	1982247.4	3764.4	REC 12
13	6858236.2	1977828.7	3660.8	REC 13
14	6858038.1	1977778.9	3740.2	REC 14
15	6858870.1	1976279.9	3740.2	REC 15
16	6858620.4	1976230.3	3740.2	REC 16
17	6848450.1	2000948.5	3740.2	REC 17
18	6851259.8	1989597.4	3694.9	REC 18
19	6852713.9	1989240.2	3740.2	REC 19
20	6849928.5	1989501.3	3671.3	REC 20
21	6854339.9	1986844.8	3672.9	REC 21
22	6854425.2	1987009.8	3661.4	REC 22
23	6854350.4	1987100.7	3661.4	REC 23
24	6854632.9	1985670.3	3674.5	REC 24
25	6854632.9	1985067.9	3674.5	REC 25
26	6855426.5	1984684.4	3674.5	REC 26
27	6854899.3	1984684.4	3674.5	REC 27
28	6854393.0	1983883.2	3674.5	REC 28
29	6854323.8	1983457.0	3674.5	REC 29
30	6855724.7	1982871.4	3674.5	REC 30
31	6855357.3	1983244.4	3694.9	REC 31
32	6854425.2	1982930.1	3707.3	REC 32
33	6854425.2	1982266.4	3707.3	REC 33
34	6855413.7	1982266.4	3707.3	REC 34
35	6852837.6	1984313.0	3740.2	REC 35
36	6852304.8	1983881.2	3750.7	REC 36
37	6852086.6	1984190.3	3750.7	REC 37
38	6854286.1	1986641.7	3674.5	REC 38
39	6854392.7	1986737.5	3674.5	REC 39
40	6859845.8	1971341.9	3674.5	REC 40

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DROP-OFF RATES

```
 LANE |       RECEIVER NO.
  No. |      1    2    3    4    5    6    7    8
9    10   11   12   13   14   15   16   17   18
19   20   21   22   23   24   25   26   27   28
29   30   31   32   33   34   35   36   37   38
39   40

   1  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   2  |     3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0
3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0
3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0
```

```
3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0
3.0  3.0
   3  |     3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0
3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0
3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0
3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0
3.0  3.0
   4  |     3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0
3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0
3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0
3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0  3.0
3.0  3.0
==================================================
====================

**** Sound 2000 (Caltrans Version of
Stamina2/Optima) ****


INPUT DATA FILE : F:\Projects\District
9\Inyo\213400\text files\alt 3
finished\alt3laneclwelevmodel.txt
DATE            : 7/24/03

ALTERNATIVE 3

==================================================
====================
TRAFFIC DATA

LANE        AUTO      MEDIUM TRKS    HEAVY TRKS
 NO.      VPH  MPH      VPH  MPH      VPH  MPH
DESCRIPTION
--------------------------------------------------
--------------------
   1        55   55        55  55        55   55
   2        55   55        55  55        55   55
   3        55   55        55  55        55   55
   4        55   55        55  55        55   55
   5        55   55        55  55        55   55
   6        55   55        55  55        55   55
   7        55   55        55  55        55   55
   8        55   55        55  55        55   55
   9        55   55        55  55        55   55
==================================================
====================

LANE DATA

LANE SEG. GRADE
SEGMENT       LANE
 NO.  NO. COR.        X            Y        Z
DESCRIPTION   DESCRIPTION
--------------------------------------------------
--------------------
   1   1  Y        6849002.7    2022593.0  3671.3
1              1
       2  Y        6849010.6    2022254.0  3671.3
2
       3  Y        6849017.3    2022052.0  3671.3
3
       4  Y        6849025.6    2021861.0  3661.4
4
       5  Y        6849027.9    2021633.0  3656.5
5
       6  Y        6849049.4    2020798.0  3656.5
6
       7  Y        6849113.5    2018357.0  3656.5
7
       8  Y        6849122.7    2018005.0  3661.4
8
       9  Y        6849150.7    2016822.0  3685.2
9
      10  Y        6849174.2    2015977.0  3681.1
10
```

	11	Y		6849183.8	2015623.0	3685.2	11
	12	Y		6849182.6	2015460.0	3686.0	12
	13	Y		6849216.0	2014207.0	3681.1	13
	14	Y		6849231.9	2014076.0	3622.0	14
				6849225.7	2013861.0	3651.6	15
2	1	Y	2	6849225.7	2013861.0	3651.6	15
	2	Y		6849237.8	2013413.0	3651.6	16
	3	Y		6849208.8	2013021.0	3651.6	17
	4	Y		6849112.9	2012669.0	3651.6	18
	5	Y		6848943.5	2012178.0	3656.5	19
	6	Y		6848899.6	2011980.0	3641.7	20
	7	Y		6848870.2	2011712.0	3636.8	21
	8	Y		6848878.0	2011518.0	3631.9	22
	9	Y		6848866.1	2011156.0	3627.0	23
	10	Y		6848846.8	2011123.0	3627.0	25
				6848846.5	2011058.0	3627.0	29
3	1	Y		6848846.5	2011058.0	3627.0	3
	2	Y		6848862.9	2011054.0	3627.0	138
	3	Y		6848902.2	2011008.0	3627.0	142

	4	Y		6848926.8	2010952.0	3627.0	145
	5	Y		6848973.1	2010921.0	3631.9	147
	6	Y		6849043.0	2010533.0	3636.8	148
	7	Y		6849088.6	2010278.0	3636.8	149
				6849200.1	2009659.0	3651.6	150
4	1	Y	4	6849200.4	2009659.0	3651.6	150
	2	Y		6849246.4	2009445.0	3651.6	151
	3	Y		6849292.5	2009116.0	3617.1	152
	4	Y		6849394.7	2008574.0	3676.2	153
	5	Y		6849444.7	2008283.0	3681.1	154
	6	Y		6849522.3	2007897.0	3676.2	155
	7	Y		6849621.6	2007326.0	3674.5	156
	8	Y		6849671.7	2006948.0	3674.5	157
	9	Y		6849683.7	2006729.0	3677.8	158
	10	Y		6849669.2	2006437.0	3677.8	159
	11	Y		6849637.4	2006079.0	3677.8	160
	12	Y		6849563.3	2005634.0	3677.8	161
	13	Y		6849488.0	2005374.0	3677.8	162
	14	Y		6849409.4	2005155.0	3681.1	163

164		15	Y		6849242.2	2004801.0	3676.2
165					6849162.4	2004475.0	3676.2
165	5	1	Y	5	6849162.4	2004475.0	3676.2
166		2	Y		6848968.5	2003931.0	3676.2
167		3	Y		6848708.3	2003218.0	3646.7
168		4	Y		6848649.9	2003053.0	3646.7
169		5	Y		6848544.3	2002763.0	3646.7
170		6	Y		6848476.7	2002575.0	3646.7
171		7	Y		6848365.8	2002253.0	3646.7
172		8	Y		6848325.5	2002106.0	3638.2
173		9	Y		6848197.7	2000613.0	3636.8
174		10	Y		6848207.0	2000204.0	3636.8
175		11	Y		6848207.6	1999982.0	3638.5
176		12	Y		6848258.1	1999412.0	3638.5
177		13	Y		6848216.7	1999292.0	3641.7
178		14	Y		6848268.1	1998720.0	3643.4
179		15	Y		6848234.6	1998607.0	3646.7
180					6848248.2	1998441.0	3661.4
180	6	1	Y	6	6848248.2	1998441.0	3661.4
181		2	Y		6848286.0	1998188.0	3661.4
182		3	Y		6848295.1	1996795.0	3663.1
183		4	Y		6848295.1	1996538.0	3663.1
184		5	Y		6848307.2	1995783.0	3664.7
185		6	Y		6848318.9	1994730.0	3666.3
186		7	Y		6848333.5	1993896.0	3666.3
187		8	Y		6848344.3	1993324.0	3666.3
188		9	Y		6848361.0	1991743.0	3666.3
189		10	Y		6848379.6	1990466.0	3700.8
190		11	Y		6848425.8	1990003.0	3700.8
191		12	Y		6848579.6	1989350.0	3700.8
192		13	Y		6848804.9	1988795.0	3700.8
193		14	Y		6848941.2	1988551.0	3700.8
194		15	Y		6849108.7	1988288.0	3700.8
195					6849506.9	1987777.0	3700.8
195	7	1	Y	7	6849506.9	1987777.0	3700.8
196		2	Y		6849730.7	1987510.0	3700.8
197		3	Y		6850461.8	1986631.0	3735.2
199		4	Y		6850790.7	1986234.0	3730.3

```
      5  Y        6850887.1   1986109.0  3730.3
198
      6  Y        6851034.8   1985892.0  3730.3
200
      7  Y        6851272.3   1985469.0  3730.3
201
      8  Y        6851388.3   1985199.0  3730.3
202
      9  Y        6851620.2   1984550.0  3750.0
203
                  6851803.5   1984018.0  3754.9
204
   8  1  Y        6862353.2   1967279.0  3731.6
3          8
      2  Y        6862212.8   1968089.0  3731.6
2
      3  Y        6861437.6   1970198.0  3731.6
4
      4  Y        6861109.1   1971018.0  3731.6
5
      5  Y        6861020.6   1971239.0  3731.6
6
      6  Y        6860830.3   1971722.0  3731.6
7
      7  Y        6860738.1   1971949.0  3731.6
8
      8  Y        6860506.8   1972524.0  3731.6
10
                  6860623.3   1972235.0  3731.6
9
   9  1  Y        6860460.5   1972640.0  3731.6
11         9
      2  Y        6860396.9   1972798.0  3731.6
12
      3  Y        6860243.7   1973169.0  3731.6
13
      4  Y        6859293.6   1974938.0  3731.6
15
```

```
      5  Y        6855971.1   1978795.0  3731.6
14
      6  Y        6855270.3   1979526.0  3731.6
16
      7  Y        6854597.1   1980300.0  3731.6
17
      8  Y        6853822.8   1980908.0  3731.6
18
      9  Y        6852825.5   1982305.0  3731.6
19
                  6851803.5   1984018.0  3754.9
==================================================
====================

BARRIER DATA


Barrier No.   1    Barrier Description:
Type: Wall Barrier

Height Increment (DELZ) =  2          No. Height
Changes (P)= 3

                                GROUND     TOP
BARRIER
SEG         X          Y         (ZO)      (Z)
HEIGHTS AT ENDS
--------------------------------------------------
--------------------
 1       6848109.0  2001097.0     3667.8   3679.81
*   12
         6848116.5  2000407.0     3667.8   3679.82
*   12


--------------------------------------------------
--------------------
```

```
Barrier No.   2    Barrier Description:
Type: Wall Barrier

Height Increment (DELZ) =  2           No. Height
Changes (P)= 3

                                GROUND     TOP
BARRIER
SEG         X          Y         (ZO)      (Z)
HEIGHTS AT ENDS
--------------------------------------------------
--------------------
 1       6848558.1  1989961.0     3656.8
3668.8B2 P1    *   12
         6848816.3  1989077.0     3656.8
3668.8B2 P2    *   12


--------------------------------------------------
--------------------
Barrier No.   3    Barrier Description:
Type: Wall Barrier

Height Increment (DELZ) =  2           No. Height
Changes (P)= 3

                                GROUND     TOP
BARRIER
SEG         X          Y         (ZO)      (Z)
HEIGHTS AT ENDS
--------------------------------------------------
--------------------
 1       6851686.0  1984735.0     3730.3
3742.3B3 P1    *   12
         6852171.3  1983476.0     3730.3
3742.3B3 P2    *   12

--------------------------------------------------
--------------------
Barrier No.   4    Barrier Description:
Type: Wall Barrier

Height Increment (DELZ) =  2           No. Height
Changes (P)= 3

                                GROUND     TOP
BARRIER
SEG         X          Y         (ZO)      (Z)
HEIGHTS AT ENDS
--------------------------------------------------
--------------------
 1       6853471.1  1981802.0     3731.6
3743.6B4 P1    *   12
         6853054.5  1982292.0     3754.9
3766.9B4 P2    *   12


--------------------------------------------------
--------------------
==================================================
====================

RECEIVER DATA


REC
NO.         X          Y         Z         ID
--------------------------------------------------
--------------------
   1     6847866.6  2000575.3  3647.6      A
   2     6848060.8  2000575.3  3657.2      A1
   3     6848765.1  2002020.2  3636.2      F
   4     6850053.1  1990008.5  3678.6      L
   5     6852270.9  1988618.3  3672.9      K
   6     6853009.7  1988311.1  3663.1      M
```

```
   7      6854497.1  1987176.3  3661.3       B
   8      6854384.2  1986184.9  3735.2       C
   9      6852076.9  1984763.1  3687.0       D
   10     6852554.3  1984763.1  3687.0       D
   11     6854057.6  1984741.3  3687.0       E
   12     6853550.3  1982247.5  3735.2       I
   13     6858236.2  1977828.6  3731.6       J
   14     6858038.1  1977779.0  3731.6       J
   15     6858870.1  1976280.0  3747.4       G
   16     6858620.5  1976230.4  3747.4       H
   17     6848450.1  2000948.4  3636.2       F
   18     6851260.0  1989597.3  3683.5       L
   19     6852713.9  1989240.2  3663.1       M
   20     6849928.5  1989501.4  3683.5       L
   21     6854339.9  1986844.8  3662.1       B
   22     6854425.1  1987010.0  3662.1       B
   23     6854350.6  1987100.6  3662.1       B
   24     6854632.8  1985670.2  3662.1       B
   25     6854632.8  1985068.0  3662.1       B
   26     6855426.4  1984684.3  3735.2       I
   27     6854899.1  1984684.3  3735.2       I
   28     6854393.2  1983883.4  3735.2       I
   29     6854323.9  1983457.0  3735.2       I
   30     6855724.6  1982871.4  3735.2       I
   31     6855357.1  1983244.4  3735.2       I
   32     6854425.1  1982930.0  3735.2       I
   33     6854425.1  1982266.5  3735.2       I
   34     6855413.6  1982266.5  3735.2       I
   35     6852837.5  1984312.9  3687.0       D
   36     6852304.9  1983881.2  3687.0       D
   37     6852086.5  1984190.3  3687.0       D
   38     6854286.1  1986641.7  3661.3       B
   39     6854392.6  1986737.7  3661.3       B
   40     6859845.7  1971341.7  3755.6
MODELED
==================================================
====================
```

```
DROP-OFF RATES


 LANE |       RECEIVER NO.
  No. |      1    2    3    4    5    6    7    8
9    10   11   12   13   14   15   16   17   18
19   20   21   22   23   24   25   26   27   28
29   30   31   32   33   34   35   36   37   38
39   40
__________________________________________________
____________________________
   1  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   2  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   3  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   4  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   5  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   6  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
```

```
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   7  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   8  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
   9  |     4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5  4.5
4.5  4.5
==================================================
====================
```

```
SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

 TITLE:
 ALTERNATIVE 1


1
          BARRIER DATA
          ************

 BAR              BARRIER HEIGHTS
BAR
 ELE    0    1    2    3    4    5    6    7    ID
LENGTH  TYPE
 -------------------------------------------------
-----------------------------
  1     -   6.   8.  10.  12.* 14.  16.  18.   1
690.0

  2     -   6.   8.  10.  12.* 14.  16.  18.   3
618.5
 -------------------------------------------------
-----------------------------
        0    1    2    3    4    5    6    7
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
  1   A        67.    500.   51.4
  2   A1       67.    500.   49.2
  3   F        67.    500.   56.6
  4  L         67.    500.   45.7
  5  K         67.    500.   48.7
  6  M         67.    500.   51.4
  7  B         67.    500.   62.4
  8  C         67.    500.   53.6
  9  D         67.    500.   41.3
 10  D         67.    500.   42.5
 11  E         67.    500.   47.8
 12  I         67.    500.   42.5
 13  J         67.    500.   60.7
 14  J         67.    500.   56.7
 15  G         67.    500.   60.7
 16  H         67.    500.   56.0
 17  REC 17    67.    500.   65.2
 18  REC 18    67.    500.   49.5
 19  REC 19    67.    500.   51.2
 20  REC 20    67.    500.   43.9
 21  B         67.    500.   56.2
 22  B         67.    500.   58.8
 23  B         67.    500.   58.2
 24  B         67.    500.   54.1
 25  B         67.    500.   51.9
 26   I        67.    500.   59.7
 27   I        67.    500.   52.8
 28   I        67.    500.   47.7
 29   I        67.    500.   46.7
 30   I        67.    500.   53.7
 31   I        67.    500.   51.9
 32   I        67.    500.   46.2
 33   I        67.    500.   45.2
 34   I        67.    500.   49.7
 35  D         67.    500.   42.8
 36  D         67.    500.   41.0
 37  D         67.    500.   40.8
 38  B         67.    500.   54.5
 39  B         67.    500.   56.3
 40   MODELED  67.    500.   49.3
 BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
   4  4
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 12.12.
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
```

```
  1   A          67.     500.   56.1
  2   A1         67.     500.   60.0
  3   F          67.     500.   56.6
  4  L           67.     500.   45.7
  5  K           67.     500.   50.1
  6  M           67.     500.   51.8
  7  B           67.     500.   62.4
  8  C           67.     500.   53.6
  9  D           67.     500.   41.4
 10  D           67.     500.   42.6
 11  E           67.     500.   47.8
 12  I           67.     500.   42.5
 13  J           67.     500.   60.7
 14  J           67.     500.   56.7
 15  G           67.     500.   60.7
 16  H           67.     500.   56.0
 17  REC 17      67.     500.   65.2
 18  REC 18      67.     500.   49.7
 19  REC 19      67.     500.   60.2
 20  REC 20      67.     500.   44.1
 21  B           67.     500.   56.2
 22  B           67.     500.   58.8
 23  B           67.     500.   58.2
 24  B           67.     500.   54.1
 25  B           67.     500.   51.9
 26   I          67.     500.   59.7
 27   I          67.     500.   52.8
 28   I          67.     500.   47.7
 29   I          67.     500.   46.7
 30   I          67.     500.   53.7
 31   I          67.     500.   51.9
 32   I          67.     500.   46.2
 33   I          67.     500.   45.2
 34   I          67.     500.   49.7
 35  D           67.     500.   42.8
 36  D           67.     500.   41.0
 37  D           67.     500.   40.8
 38  B           67.     500.   54.5
 39  B           67.     500.   56.3
 40   MODELED    67.     500.   49.3
 BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
   0  0
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
  0. 0.
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
  1   A          67.     500.   51.6
  2   A1         67.     500.   50.1
  3   F          67.     500.   56.6
  4  L           67.     500.   45.7
  5  K           67.     500.   49.2
  6  M           67.     500.   51.6
  7  B           67.     500.   62.4
  8  C           67.     500.   53.6
  9  D           67.     500.   41.4
 10  D           67.     500.   42.6
 11  E           67.     500.   47.8
 12  I           67.     500.   42.5
 13  J           67.     500.   60.7
 14  J           67.     500.   56.7
 15  G           67.     500.   60.7
 16  H           67.     500.   56.0
 17  REC 17      67.     500.   65.2
 18  REC 18      67.     500.   49.7
 19  REC 19      67.     500.   54.6
 20  REC 20      67.     500.   44.0
 21  B           67.     500.   56.2
 22  B           67.     500.   58.8
 23  B           67.     500.   58.2
 24  B           67.     500.   54.1
 25  B           67.     500.   51.9
 26   I          67.     500.   59.7
 27   I          67.     500.   52.8
 28   I          67.     500.   47.7
 29   I          67.     500.   46.7
```

```
 30   I         67.    500.   53.7
 31   I         67.    500.   51.9
 32   I         67.    500.   46.2
 33   I         67.    500.   45.2
 34   I         67.    500.   49.7
 35  D          67.    500.   42.8
 36  D          67.    500.   41.0
 37  D          67.    500.   40.8
 38  B          67.    500.   54.5
 39  B          67.    500.   56.3
 40   MODELED  67.    500.   49.3
 BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
   1  1
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
  6. 6.
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
  1   A         67.    500.   51.5
  2   A1        67.    500.   49.7
  3   F         67.    500.   56.6
  4  L          67.    500.   45.7
  5  K          67.    500.   49.0
  6  M          67.    500.   51.5
  7  B          67.    500.   62.4
  8  C          67.    500.   53.6
  9  D          67.    500.   41.4
 10  D          67.    500.   42.6
 11  E          67.    500.   47.8
 12  I          67.    500.   42.5
 13  J          67.    500.   60.7
 14  J          67.    500.   56.7
 15  G          67.    500.   60.7
 16  H          67.    500.   56.0
 17  REC 17     67.    500.   65.2
 18  REC 18     67.    500.   49.6
 19  REC 19     67.    500.   53.3
 20  REC 20     67.    500.   44.0
```

```
 21  B          67.    500.   56.2
 22  B          67.    500.   58.8
 23  B          67.    500.   58.2
 24  B          67.    500.   54.1
 25  B          67.    500.   51.9
 26   I         67.    500.   59.7
 27   I         67.    500.   52.8
 28   I         67.    500.   47.7
 29   I         67.    500.   46.7
 30   I         67.    500.   53.7
 31   I         67.    500.   51.9
 32   I         67.    500.   46.2
 33   I         67.    500.   45.2
 34   I         67.    500.   49.7
 35  D          67.    500.   42.8
 36  D          67.    500.   41.0
 37  D          67.    500.   40.8
 38  B          67.    500.   54.5
 39  B          67.    500.   56.3
 40   MODELED  67.    500.   49.3
 BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
   2  2
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
  8. 8.
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
  1   A         67.    500.   51.4
  2   A1        67.    500.   49.4
  3   F         67.    500.   56.6
  4  L          67.    500.   45.7
  5  K          67.    500.   48.8
  6  M          67.    500.   51.5
  7  B          67.    500.   62.4
  8  C          67.    500.   53.6
  9  D          67.    500.   41.4
 10  D          67.    500.   42.6
 11  E          67.    500.   47.8
```

```
 12  I          67.    500.   42.5
 13  J          67.    500.   60.7
 14  J          67.    500.   56.7
 15  G          67.    500.   60.7
 16  H          67.    500.   56.0
 17  REC 17     67.    500.   65.2
 18  REC 18     67.    500.   49.6
 19  REC 19     67.    500.   52.1
 20  REC 20     67.    500.   44.0
 21  B          67.    500.   56.2
 22  B          67.    500.   58.8
 23  B          67.    500.   58.2
 24  B          67.    500.   54.1
 25  B          67.    500.   51.9
 26   I         67.    500.   59.7
 27   I         67.    500.   52.8
 28   I         67.    500.   47.7
 29   I         67.    500.   46.7
 30   I         67.    500.   53.7
 31   I         67.    500.   51.9
 32   I         67.    500.   46.2
 33   I         67.    500.   45.2
 34   I         67.    500.   49.7
 35  D          67.    500.   42.8
 36  D          67.    500.   41.0
 37  D          67.    500.   40.8
 38  B          67.    500.   54.5
 39  B          67.    500.   56.3
 40   MODELED  67.    500.   49.3
 BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
   3  3
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 10.10.
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
  1   A         67.    500.   51.4
  2   A1        67.    500.   49.2
  3   F         67.    500.   56.6
  4  L          67.    500.   45.7
  5  K          67.    500.   48.7
  6  M          67.    500.   51.4
  7  B          67.    500.   62.4
  8  C          67.    500.   53.6
  9  D          67.    500.   41.3
 10  D          67.    500.   42.5
 11  E          67.    500.   47.8
 12  I          67.    500.   42.5
 13  J          67.    500.   60.7
 14  J          67.    500.   56.7
 15  G          67.    500.   60.7
 16  H          67.    500.   56.0
 17  REC 17     67.    500.   65.2
 18  REC 18     67.    500.   49.5
 19  REC 19     67.    500.   51.2
 20  REC 20     67.    500.   43.9
 21  B          67.    500.   56.2
 22  B          67.    500.   58.8
 23  B          67.    500.   58.2
 24  B          67.    500.   54.1
 25  B          67.    500.   51.9
 26   I         67.    500.   59.7
 27   I         67.    500.   52.8
 28   I         67.    500.   47.7
 29   I         67.    500.   46.7
 30   I         67.    500.   53.7
 31   I         67.    500.   51.9
 32   I         67.    500.   46.2
 33   I         67.    500.   45.2
 34   I         67.    500.   49.7
 35  D          67.    500.   42.8
 36  D          67.    500.   41.0
 37  D          67.    500.   40.8
 38  B          67.    500.   54.5
 39  B          67.    500.   56.3
 40   MODELED  67.    500.   49.3
```

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
4 4
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
12.12.
1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	A	67.	500.	51.4
2	A1	67.	500.	49.0
3	F	67.	500.	56.6
4	L	67.	500.	45.6
5	K	67.	500.	48.7
6	M	67.	500.	51.4
7	B	67.	500.	62.4
8	C	67.	500.	53.6
9	D	67.	500.	41.3
10	D	67.	500.	42.5
11	E	67.	500.	47.7
12	I	67.	500.	42.5
13	J	67.	500.	60.7
14	J	67.	500.	56.7
15	G	67.	500.	60.7
16	H	67.	500.	56.0
17	REC 17	67.	500.	65.2
18	REC 18	67.	500.	49.5
19	REC 19	67.	500.	50.4
20	REC 20	67.	500.	43.9
21	B	67.	500.	56.2
22	B	67.	500.	58.8
23	B	67.	500.	58.2
24	B	67.	500.	54.1
25	B	67.	500.	51.9
26	I	67.	500.	59.7
27	I	67.	500.	52.8
28	I	67.	500.	47.7
29	I	67.	500.	46.7
30	I	67.	500.	53.7
31	I	67.	500.	51.9
32	I	67.	500.	46.2
33	I	67.	500.	45.2
34	I	67.	500.	49.7
35	D	67.	500.	42.8
36	D	67.	500.	41.0
37	D	67.	500.	40.8
38	B	67.	500.	54.5
39	B	67.	500.	56.3
40	MODELED	67.	500.	49.3

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
5 5
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
14.14.
1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	A	67.	500.	51.3
2	A1	67.	500.	48.9
3	F	67.	500.	56.6
4	L	67.	500.	45.6
5	K	67.	500.	48.6
6	M	67.	500.	51.4
7	B	67.	500.	62.4
8	C	67.	500.	53.6
9	D	67.	500.	41.3
10	D	67.	500.	42.5
11	E	67.	500.	47.7
12	I	67.	500.	42.5
13	J	67.	500.	60.7
14	J	67.	500.	56.7
15	G	67.	500.	60.7
16	H	67.	500.	56.0
17	REC 17	67.	500.	65.2
18	REC 18	67.	500.	49.5
19	REC 19	67.	500.	49.7
20	REC 20	67.	500.	43.9
21	B	67.	500.	56.2
22	B	67.	500.	58.8

```
23  B          67.    500.   58.2
24  B          67.    500.   54.1
25  B          67.    500.   51.9
26   I         67.    500.   59.7
27   I         67.    500.   52.8
28   I         67.    500.   47.7
29   I         67.    500.   46.7
30   I         67.    500.   53.7
31   I         67.    500.   51.9
32   I         67.    500.   46.2
33   I         67.    500.   45.2
34   I         67.    500.   49.7
35  D          67.    500.   42.8
36  D          67.    500.   41.0
37  D          67.    500.   40.8
38  B          67.    500.   54.5
39  B          67.    500.   56.3
40   MODELED  67.    500.   49.3
BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
  6  6
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
16.16.
```

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SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

 TITLE:
 ALTERNATIVE 2 OLANCHA


1
          BARRIER DATA
          ************

 BAR              BARRIER HEIGHTS
BAR
 ELE    0    1    2    3    4    5    6    7    ID
LENGTH  TYPE
 --------------------------------------------------
-----------------------------
  1     -   6.   8.  10.  12.* 14.  16.  18.   `1
407.3

  2     -   4.   6.   8.  10.* 12.  14.  16.   B1
P1     3031.5
 --------------------------------------------------
-----------------------------
        0    1    2    3    4    5    6    7
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
  1  REC 1     67.    500.   55.3
  2  REC 2     67.    500.   58.9
  3  REC 3     67.    500.   57.4
  4  REC 4     67.    500.   54.4
  5  REC 5     67.    500.   59.4
  6  REC 6     67.    500.   64.2
  7  REC 7     67.    500.   66.9
  8  REC 8     67.    500.   57.0
  9  REC 9     67.    500.   48.5
 10  REC 10    67.    500.   49.1
 11  REC 11    67.    500.   50.6
 12  REC 12    67.    500.   48.9
 13  REC 13    67.    500.   60.5
 14  REC 14    67.    500.   58.8
 15  REC 15    67.    500.   60.5
 16  REC 16    67.    500.   58.6
 17  REC 17    67.    500.   63.5
 18  REC 18    67.    500.   57.4
 19  REC 19    67.    500.   66.0
 20  REC 20    67.    500.   52.8
 21  REC 21    67.    500.   64.4
 22  REC 22    67.    500.   72.5
 23  REC 23    67.    500.   73.1
 24  REC 24    67.    500.   53.4
 25  REC 25    67.    500.   51.2
 26  REC 26    67.    500.   48.8
 27  REC 27    67.    500.   50.6
 28  REC 28    67.    500.   50.6
 29  REC 29    67.    500.   50.6
 30  REC 30    67.    500.   56.6
 31  REC 31    67.    500.   54.4
 32  REC 32    67.    500.   51.0
 33  REC 33    67.    500.   50.9
 34  REC 34    67.    500.   54.3
 35  REC 35    67.    500.   48.8
 36  REC 36    67.    500.   47.8
 37  REC 37    67.    500.   47.8
 38  REC 38    67.    500.   61.1
 39  REC 39    67.    500.   63.6
 40  REC 40    67.    500.   57.5
 BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
   4  4
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 12.10.
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
  1  REC 1     67.    500.   55.3
  2  REC 2     67.    500.   58.9
```

3	REC 3	67.	500.	57.4
4	REC 4	67.	500.	54.8
5	REC 5	67.	500.	59.7
6	REC 6	67.	500.	64.2
7	REC 7	67.	500.	66.9
8	REC 8	67.	500.	59.6
9	REC 9	67.	500.	50.1
10	REC 10	67.	500.	51.0
11	REC 11	67.	500.	54.3
12	REC 12	67.	500.	50.3
13	REC 13	67.	500.	60.5
14	REC 14	67.	500.	58.8
15	REC 15	67.	500.	60.5
16	REC 16	67.	500.	58.6
17	REC 17	67.	500.	63.5
18	REC 18	67.	500.	58.5
19	REC 19	67.	500.	66.0
20	REC 20	67.	500.	53.3
21	REC 21	67.	500.	64.7
22	REC 22	67.	500.	72.5
23	REC 23	67.	500.	73.1
24	REC 24	67.	500.	58.8
25	REC 25	67.	500.	56.9
26	REC 26	67.	500.	60.0
27	REC 27	67.	500.	57.1
28	REC 28	67.	500.	53.9
29	REC 29	67.	500.	53.2
30	REC 30	67.	500.	57.3
31	REC 31	67.	500.	56.2
32	REC 32	67.	500.	52.8
33	REC 33	67.	500.	52.1
34	REC 34	67.	500.	54.9
35	REC 35	67.	500.	51.0
36	REC 36	67.	500.	49.6
37	REC 37	67.	500.	49.5
38	REC 38	67.	500.	61.8
39	REC 39	67.	500.	64.0
40	REC 40	67.	500.	57.5

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
  0 0
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 0. 0.

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	REC 1	67.	500.	55.3
2	REC 2	67.	500.	58.9
3	REC 3	67.	500.	57.4
4	REC 4	67.	500.	54.4
5	REC 5	67.	500.	59.5
6	REC 6	67.	500.	64.2
7	REC 7	67.	500.	66.9
8	REC 8	67.	500.	57.0
9	REC 9	67.	500.	48.5
10	REC 10	67.	500.	49.1
11	REC 11	67.	500.	50.6
12	REC 12	67.	500.	48.9
13	REC 13	67.	500.	60.5
14	REC 14	67.	500.	58.8
15	REC 15	67.	500.	60.5
16	REC 16	67.	500.	58.6
17	REC 17	67.	500.	63.5
18	REC 18	67.	500.	57.4
19	REC 19	67.	500.	66.0
20	REC 20	67.	500.	52.8
21	REC 21	67.	500.	64.4
22	REC 22	67.	500.	72.5
23	REC 23	67.	500.	73.1
24	REC 24	67.	500.	53.4
25	REC 25	67.	500.	51.2
26	REC 26	67.	500.	48.8
27	REC 27	67.	500.	50.6
28	REC 28	67.	500.	50.6
29	REC 29	67.	500.	50.6
30	REC 30	67.	500.	56.6
31	REC 31	67.	500.	54.4

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 32  REC 32    67.    500.   51.0
 33  REC 33    67.    500.   50.9
 34  REC 34    67.    500.   54.3
 35  REC 35    67.    500.   48.8
 36  REC 36    67.    500.   47.8
 37  REC 37    67.    500.   47.8
 38  REC 38    67.    500.   61.1
 39  REC 39    67.    500.   63.6
 40  REC 40    67.    500.   57.5
 BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
   1  2
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
  6. 6.
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
  1  REC 1     67.    500.   55.3
  2  REC 2     67.    500.   58.9
  3  REC 3     67.    500.   57.4
  4  REC 4     67.    500.   54.4
  5  REC 5     67.    500.   59.4
  6  REC 6     67.    500.   64.2
  7  REC 7     67.    500.   66.9
  8  REC 8     67.    500.   57.0
  9  REC 9     67.    500.   48.5
 10  REC 10    67.    500.   49.1
 11  REC 11    67.    500.   50.6
 12  REC 12    67.    500.   48.9
 13  REC 13    67.    500.   60.5
 14  REC 14    67.    500.   58.8
 15  REC 15    67.    500.   60.5
 16  REC 16    67.    500.   58.6
 17  REC 17    67.    500.   63.5
 18  REC 18    67.    500.   57.4
 19  REC 19    67.    500.   66.0
 20  REC 20    67.    500.   52.8
 21  REC 21    67.    500.   64.4
 22  REC 22    67.    500.   72.5
 23  REC 23    67.    500.   73.1
 24  REC 24    67.    500.   53.4
 25  REC 25    67.    500.   51.2
 26  REC 26    67.    500.   48.8
 27  REC 27    67.    500.   50.6
 28  REC 28    67.    500.   50.6
 29  REC 29    67.    500.   50.6
 30  REC 30    67.    500.   56.6
 31  REC 31    67.    500.   54.4
 32  REC 32    67.    500.   51.0
 33  REC 33    67.    500.   50.9
 34  REC 34    67.    500.   54.3
 35  REC 35    67.    500.   48.8
 36  REC 36    67.    500.   47.8
 37  REC 37    67.    500.   47.8
 38  REC 38    67.    500.   61.1
 39  REC 39    67.    500.   63.6
 40  REC 40    67.    500.   57.5
 BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
   2  3
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
  8. 8.
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
  1  REC 1     67.    500.   55.3
  2  REC 2     67.    500.   58.9
  3  REC 3     67.    500.   57.4
  4  REC 4     67.    500.   54.4
  5  REC 5     67.    500.   59.4
  6  REC 6     67.    500.   64.2
  7  REC 7     67.    500.   66.9
  8  REC 8     67.    500.   57.0
  9  REC 9     67.    500.   48.5
 10  REC 10    67.    500.   49.1
 11  REC 11    67.    500.   50.6
 12  REC 12    67.    500.   48.9
 13  REC 13    67.    500.   60.5
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 14  REC 14    67.    500.   58.8
 15  REC 15    67.    500.   60.5
 16  REC 16    67.    500.   58.6
 17  REC 17    67.    500.   63.5
 18  REC 18    67.    500.   57.4
 19  REC 19    67.    500.   66.0
 20  REC 20    67.    500.   52.8
 21  REC 21    67.    500.   64.4
 22  REC 22    67.    500.   72.5
 23  REC 23    67.    500.   73.1
 24  REC 24    67.    500.   53.4
 25  REC 25    67.    500.   51.2
 26  REC 26    67.    500.   48.8
 27  REC 27    67.    500.   50.6
 28  REC 28    67.    500.   50.6
 29  REC 29    67.    500.   50.6
 30  REC 30    67.    500.   56.6
 31  REC 31    67.    500.   54.4
 32  REC 32    67.    500.   51.0
 33  REC 33    67.    500.   50.9
 34  REC 34    67.    500.   54.3
 35  REC 35    67.    500.   48.8
 36  REC 36    67.    500.   47.8
 37  REC 37    67.    500.   47.8
 38  REC 38    67.    500.   61.1
 39  REC 39    67.    500.   63.6
 40  REC 40    67.    500.   57.5
 BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
   3  4
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 10.10.
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
  1  REC 1     67.    500.   55.3
  2  REC 2     67.    500.   58.9
  3  REC 3     67.    500.   57.4
  4  REC 4     67.    500.   54.4
  5  REC 5     67.    500.   59.4
  6  REC 6     67.    500.   64.2
  7  REC 7     67.    500.   66.9
  8  REC 8     67.    500.   57.0
  9  REC 9     67.    500.   48.5
 10  REC 10    67.    500.   49.1
 11  REC 11    67.    500.   50.6
 12  REC 12    67.    500.   48.9
 13  REC 13    67.    500.   60.5
 14  REC 14    67.    500.   58.8
 15  REC 15    67.    500.   60.5
 16  REC 16    67.    500.   58.6
 17  REC 17    67.    500.   63.5
 18  REC 18    67.    500.   57.4
 19  REC 19    67.    500.   66.0
 20  REC 20    67.    500.   52.8
 21  REC 21    67.    500.   64.4
 22  REC 22    67.    500.   72.5
 23  REC 23    67.    500.   73.1
 24  REC 24    67.    500.   53.4
 25  REC 25    67.    500.   51.2
 26  REC 26    67.    500.   48.8
 27  REC 27    67.    500.   50.6
 28  REC 28    67.    500.   50.6
 29  REC 29    67.    500.   50.6
 30  REC 30    67.    500.   56.6
 31  REC 31    67.    500.   54.4
 32  REC 32    67.    500.   51.0
 33  REC 33    67.    500.   50.9
 34  REC 34    67.    500.   54.3
 35  REC 35    67.    500.   48.8
 36  REC 36    67.    500.   47.8
 37  REC 37    67.    500.   47.8
 38  REC 38    67.    500.   61.1
 39  REC 39    67.    500.   63.6
 40  REC 40    67.    500.   57.5
 BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
   4  5
```

```
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 12.12.
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
   1  REC 1     67.    500.   55.3
   2  REC 2     67.    500.   58.9
   3  REC 3     67.    500.   57.4
   4  REC 4     67.    500.   54.4
   5  REC 5     67.    500.   59.4
   6  REC 6     67.    500.   64.2
   7  REC 7     67.    500.   66.9
   8  REC 8     67.    500.   57.0
   9  REC 9     67.    500.   48.5
  10  REC 10    67.    500.   49.1
  11  REC 11    67.    500.   50.6
  12  REC 12    67.    500.   48.9
  13  REC 13    67.    500.   60.5
  14  REC 14    67.    500.   58.8
  15  REC 15    67.    500.   60.5
  16  REC 16    67.    500.   58.6
  17  REC 17    67.    500.   63.5
  18  REC 18    67.    500.   57.4
  19  REC 19    67.    500.   66.0
  20  REC 20    67.    500.   52.8
  21  REC 21    67.    500.   64.4
  22  REC 22    67.    500.   72.5
  23  REC 23    67.    500.   73.1
  24  REC 24    67.    500.   53.4
  25  REC 25    67.    500.   51.2
  26  REC 26    67.    500.   48.8
  27  REC 27    67.    500.   50.6
  28  REC 28    67.    500.   50.6
  29  REC 29    67.    500.   50.6
  30  REC 30    67.    500.   56.6
  31  REC 31    67.    500.   54.4
  32  REC 32    67.    500.   51.0
  33  REC 33    67.    500.   50.9
  34  REC 34    67.    500.   54.3
  35  REC 35    67.    500.   48.8
  36  REC 36    67.    500.   47.8
  37  REC 37    67.    500.   47.8
  38  REC 38    67.    500.   61.1
  39  REC 39    67.    500.   63.6
  40  REC 40    67.    500.   57.5
 BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
   5  6
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 14.14.
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
   1  REC 1     67.    500.   55.3
   2  REC 2     67.    500.   58.9
   3  REC 3     67.    500.   57.4
   4  REC 4     67.    500.   54.4
   5  REC 5     67.    500.   59.4
   6  REC 6     67.    500.   64.2
   7  REC 7     67.    500.   66.9
   8  REC 8     67.    500.   57.0
   9  REC 9     67.    500.   48.5
  10  REC 10    67.    500.   49.1
  11  REC 11    67.    500.   50.6
  12  REC 12    67.    500.   48.9
  13  REC 13    67.    500.   60.5
  14  REC 14    67.    500.   58.8
  15  REC 15    67.    500.   60.5
  16  REC 16    67.    500.   58.6
  17  REC 17    67.    500.   63.5
  18  REC 18    67.    500.   57.4
  19  REC 19    67.    500.   66.0
  20  REC 20    67.    500.   52.8
  21  REC 21    67.    500.   64.4
  22  REC 22    67.    500.   72.5
  23  REC 23    67.    500.   73.1
  24  REC 24    67.    500.   53.4
```

```
25  REC 25    67.    500.   51.2
26  REC 26    67.    500.   48.8
27  REC 27    67.    500.   50.6
28  REC 28    67.    500.   50.6
29  REC 29    67.    500.   50.6
30  REC 30    67.    500.   56.6
31  REC 31    67.    500.   54.4
32  REC 32    67.    500.   51.0
33  REC 33    67.    500.   50.9
34  REC 34    67.    500.   54.3
35  REC 35    67.    500.   48.8
36  REC 36    67.    500.   47.8
37  REC 37    67.    500.   47.8
38  REC 38    67.    500.   61.1
39  REC 39    67.    500.   63.6
40  REC 40    67.    500.   57.5
BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
  6  7
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
16.16.
```

```
SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

 TITLE:
 ALTERNATIVE 3


1
          BARRIER DATA
          ************

 BAR              BARRIER HEIGHTS
BAR
 ELE    0    1    2    3    4    5    6    7    ID
LENGTH  TYPE
 --------------------------------------------------
-----------------------------
  1     -   6.   8.  10.  12.* 14.  16.  18.   1
690.0

  2     -   6.   8.  10.  12.* 14.  16.  18.   B2
P1      920.9

  3     -   6.   8.  10.  12.* 14.  16.  18.   B3
P1     1349.3

  4     -   6.   8.  10.  12.* 14.  16.  18.   B4
P1      643.6
 --------------------------------------------------
-----------------------------
        0    1    2    3    4    5    6    7
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
  1  A         67.    500.   51.6
  2  A1        67.    500.   50.6
  3  F         67.    500.   55.3
  4  L         67.    500.   46.4
  5  K         67.    500.   41.7
  6  M         67.    500.   40.3
  7  B         67.    500.   38.4
  8  C         67.    500.   39.7
  9  D         67.    500.   53.8
 10  D         67.    500.   49.6
 11  E         67.    500.   42.5
 12  I         67.    500.   50.2
 13  J         67.    500.   48.3
 14  J         67.    500.   49.7
 15  G         67.    500.   53.1
 16  H         67.    500.   56.6
 17  F         67.    500.   59.3
 18  L         67.    500.   42.8
 19  M         67.    500.   39.7
 20  L         67.    500.   47.7
 21  B         67.    500.   39.1
 22  B         67.    500.   38.8
 23  B         67.    500.   38.8
 24  B         67.    500.   39.9
 25  B         67.    500.   40.5
 26  I         67.    500.   39.2
 27  I         67.    500.   40.4
 28  I         67.    500.   42.9
 29  I         67.    500.   43.9
 30  I         67.    500.   41.4
 31  I         67.    500.   41.5
 32  I         67.    500.   44.7
 33  I         67.    500.   46.7
 34  I         67.    500.   43.6
 35  D         67.    500.   48.9
 36  D         67.    500.   55.0
 37  D         67.    500.   51.7
 38  B         67.    500.   39.5
 39  B         67.    500.   39.2
 40   MODELED  67.    500.   48.7
BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
  4  4  4  4
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
```

12.12.12.12.

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	A	67.	500.	56.4
2	A1	67.	500.	62.2
3	F	67.	500.	55.3
4	L	67.	500.	46.4
5	K	67.	500.	41.7
6	M	67.	500.	40.3
7	B	67.	500.	38.4
8	C	67.	500.	39.9
9	D	67.	500.	54.2
10	D	67.	500.	49.6
11	E	67.	500.	42.8
12	I	67.	500.	53.0
13	J	67.	500.	48.3
14	J	67.	500.	49.7
15	G	67.	500.	53.1
16	H	67.	500.	56.6
17	F	67.	500.	59.3
18	L	67.	500.	42.8
19	M	67.	500.	39.7
20	L	67.	500.	47.7
21	B	67.	500.	39.2
22	B	67.	500.	38.8
23	B	67.	500.	38.9
24	B	67.	500.	40.0
25	B	67.	500.	40.7
26	I	67.	500.	39.4
27	I	67.	500.	40.6
28	I	67.	500.	43.3
29	I	67.	500.	44.4
30	I	67.	500.	41.6
31	I	67.	500.	41.8
32	I	67.	500.	45.3
33	I	67.	500.	47.2
34	I	67.	500.	43.7
35	D	67.	500.	49.0
36	D	67.	500.	56.0
37	D	67.	500.	56.9
38	B	67.	500.	39.6
39	B	67.	500.	39.2
40	MODELED	67.	500.	48.7

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION

0 0 0 0

CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION

0. 0. 0. 0.

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	A	67.	500.	51.7
2	A1	67.	500.	51.0
3	F	67.	500.	55.3
4	L	67.	500.	46.4
5	K	67.	500.	41.7
6	M	67.	500.	40.3
7	B	67.	500.	38.4
8	C	67.	500.	39.9
9	D	67.	500.	54.2
10	D	67.	500.	49.6
11	E	67.	500.	42.7
12	I	67.	500.	51.1
13	J	67.	500.	48.3
14	J	67.	500.	49.7
15	G	67.	500.	53.1
16	H	67.	500.	56.6
17	F	67.	500.	59.3
18	L	67.	500.	42.8
19	M	67.	500.	39.7
20	L	67.	500.	47.7
21	B	67.	500.	39.2
22	B	67.	500.	38.8
23	B	67.	500.	38.8
24	B	67.	500.	39.9
25	B	67.	500.	40.6

26	I	67.	500.	39.3
27	I	67.	500.	40.5
28	I	67.	500.	43.1
29	I	67.	500.	44.1
30	I	67.	500.	41.5
31	I	67.	500.	41.7
32	I	67.	500.	45.0
33	I	67.	500.	47.0
34	I	67.	500.	43.7
35	D	67.	500.	48.9
36	D	67.	500.	55.9
37	D	67.	500.	53.9
38	B	67.	500.	39.5
39	B	67.	500.	39.2
40	MODELED	67.	500.	48.7

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1 1 1 1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
6. 6. 6. 6.
1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	A	67.	500.	51.6
2	A1	67.	500.	50.8
3	F	67.	500.	55.3
4	L	67.	500.	46.4
5	K	67.	500.	41.7
6	M	67.	500.	40.3
7	B	67.	500.	38.4
8	C	67.	500.	39.9
9	D	67.	500.	54.1
10	D	67.	500.	49.6
11	E	67.	500.	42.7
12	I	67.	500.	50.8
13	J	67.	500.	48.3
14	J	67.	500.	49.7
15	G	67.	500.	53.1
16	H	67.	500.	56.6
17	F	67.	500.	59.3
18	L	67.	500.	42.8
19	M	67.	500.	39.7
20	L	67.	500.	47.7
21	B	67.	500.	39.2
22	B	67.	500.	38.8
23	B	67.	500.	38.8
24	B	67.	500.	39.9
25	B	67.	500.	40.6
26	I	67.	500.	39.3
27	I	67.	500.	40.5
28	I	67.	500.	43.1
29	I	67.	500.	44.1
30	I	67.	500.	41.5
31	I	67.	500.	41.6
32	I	67.	500.	44.9
33	I	67.	500.	46.9
34	I	67.	500.	43.6
35	D	67.	500.	48.9
36	D	67.	500.	55.8
37	D	67.	500.	53.1
38	B	67.	500.	39.5
39	B	67.	500.	39.2
40	MODELED	67.	500.	48.7

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
2 2 2 2
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
8. 8. 8. 8.
1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	A	67.	500.	51.6
2	A1	67.	500.	50.7
3	F	67.	500.	55.3
4	L	67.	500.	46.4
5	K	67.	500.	41.7
6	M	67.	500.	40.3
7	B	67.	500.	38.4

8	C	67.	500.	39.7
9	D	67.	500.	54.0
10	D	67.	500.	49.6
11	E	67.	500.	42.6
12	I	67.	500.	50.5
13	J	67.	500.	48.3
14	J	67.	500.	49.7
15	G	67.	500.	53.1
16	H	67.	500.	56.6
17	F	67.	500.	59.3
18	L	67.	500.	42.8
19	M	67.	500.	39.7
20	L	67.	500.	47.7
21	B	67.	500.	39.2
22	B	67.	500.	38.8
23	B	67.	500.	38.8
24	B	67.	500.	39.9
25	B	67.	500.	40.6
26	I	67.	500.	39.2
27	I	67.	500.	40.4
28	I	67.	500.	43.0
29	I	67.	500.	44.0
30	I	67.	500.	41.4
31	I	67.	500.	41.6
32	I	67.	500.	44.8
33	I	67.	500.	46.8
34	I	67.	500.	43.6
35	D	67.	500.	48.9
36	D	67.	500.	55.4
37	D	67.	500.	52.4
38	B	67.	500.	39.5
39	B	67.	500.	39.2
40	MODELED	67.	500.	48.7

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
3 3 3 3
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
10.10.10.10.
1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	A	67.	500.	51.6
2	A1	67.	500.	50.6
3	F	67.	500.	55.3
4	L	67.	500.	46.4
5	K	67.	500.	41.7
6	M	67.	500.	40.3
7	B	67.	500.	38.4
8	C	67.	500.	39.7
9	D	67.	500.	53.8
10	D	67.	500.	49.6
11	E	67.	500.	42.5
12	I	67.	500.	50.2
13	J	67.	500.	48.3
14	J	67.	500.	49.7
15	G	67.	500.	53.1
16	H	67.	500.	56.6
17	F	67.	500.	59.3
18	L	67.	500.	42.8
19	M	67.	500.	39.7
20	L	67.	500.	47.7
21	B	67.	500.	39.1
22	B	67.	500.	38.8
23	B	67.	500.	38.8
24	B	67.	500.	39.9
25	B	67.	500.	40.5
26	I	67.	500.	39.2
27	I	67.	500.	40.4
28	I	67.	500.	42.9
29	I	67.	500.	43.9
30	I	67.	500.	41.4
31	I	67.	500.	41.5
32	I	67.	500.	44.7
33	I	67.	500.	46.7
34	I	67.	500.	43.6
35	D	67.	500.	48.9
36	D	67.	500.	55.0

```
 37  D          67.    500.   51.7
 38  B          67.    500.   39.5
 39  B          67.    500.   39.2
 40   MODELED  67.    500.   48.7
 BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
   4  4  4  4
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 12.12.12.12.
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
  1  A          67.    500.   51.6
  2  A1         67.    500.   50.5
  3  F          67.    500.   55.3
  4  L          67.    500.   46.4
  5  K          67.    500.   41.7
  6  M          67.    500.   40.3
  7  B          67.    500.   38.4
  8  C          67.    500.   39.7
  9  D          67.    500.   53.4
 10  D          67.    500.   49.6
 11  E          67.    500.   42.5
 12  I          67.    500.   50.0
 13  J          67.    500.   48.3
 14  J          67.    500.   49.7
 15  G          67.    500.   53.1
 16  H          67.    500.   56.6
 17  F          67.    500.   59.3
 18  L          67.    500.   42.8
 19  M          67.    500.   39.7
 20  L          67.    500.   47.7
 21  B          67.    500.   39.1
 22  B          67.    500.   38.7
 23  B          67.    500.   38.8
 24  B          67.    500.   39.8
 25  B          67.    500.   40.5
 26  I          67.    500.   39.2
 27  I          67.    500.   40.3
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 28  I          67.    500.   42.9
 29  I          67.    500.   43.9
 30  I          67.    500.   41.4
 31  I          67.    500.   41.5
 32  I          67.    500.   44.7
 33  I          67.    500.   46.6
 34  I          67.    500.   43.5
 35  D          67.    500.   48.9
 36  D          67.    500.   54.4
 37  D          67.    500.   51.1
 38  B          67.    500.   39.5
 39  B          67.    500.   39.1
 40   MODELED  67.    500.   48.7
 BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
   5  5  5  5
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 14.14.14.14.
1
 REC REC ID    DNL  PEOPLE   LEQ(CAL)
 --------------------------------
  1  A          67.    500.   51.6
  2  A1         67.    500.   50.5
  3  F          67.    500.   55.3
  4  L          67.    500.   46.4
  5  K          67.    500.   41.7
  6  M          67.    500.   40.3
  7  B          67.    500.   38.4
  8  C          67.    500.   39.7
  9  D          67.    500.   53.0
 10  D          67.    500.   49.6
 11  E          67.    500.   42.5
 12  I          67.    500.   49.8
 13  J          67.    500.   48.3
 14  J          67.    500.   49.7
 15  G          67.    500.   53.1
 16  H          67.    500.   56.6
 17  F          67.    500.   59.3
 18  L          67.    500.   42.8
```

```
19  M         67.    500.   39.7
20  L         67.    500.   47.7
21  B         67.    500.   39.1
22  B         67.    500.   38.5
23  B         67.    500.   38.6
24  B         67.    500.   39.8
25  B         67.    500.   40.4
26  I         67.    500.   39.1
27  I         67.    500.   40.3
28  I         67.    500.   42.9
29  I         67.    500.   43.8
30  I         67.    500.   41.3
31  I         67.    500.   41.5
32  I         67.    500.   44.6
33  I         67.    500.   46.6
34  I         67.    500.   43.5
35  D         67.    500.   48.9
36  D         67.    500.   53.6
37  D         67.    500.   50.5
38  B         67.    500.   39.5
39  B         67.    500.   39.1
40   MODELED  67.    500.   48.7
BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
  6  6  6  6
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
16.16.16.16.
```

D. Worksheet A: Reasonableness Calculation

Worksheet A		Receptor No.
Project		2
EA	09-213400	Barrier Height
ID and Location	Alt 3	6 ft.
Existing	47.5	48
Build vs. Existing	14.8	15
Achievable Noise Reduction	11.3	11
Construction after 1978? Or New Construction	No	
Base Allowance (2000 dollars)		17,000
Absolute Noise Levels		
69 or less	2000	2000
70-74 dBA	4000	0
75-78 dBA	6000	0
More than 78 dBA	8000	0
Build vs. Existing Noise Levels		
Less than 3 dBA	0	0
3-7 dBA	2000	0
8-11 dBA	4000	0
12 dBA or More	6000	6000
Achievable Noise Reduction		
Less than 6 dBA	0	0
6-8 dBA	2000	0
9-11 dBA	4000	4000
12 dBA or More	6000	0
Either New Construction or Pre-Date 1978		
Yes	10000	0
No	0	0
Total for Worksheet A, per Receiver:		29,000

Worksheet A		Receptor No.
Project		2
EA	09-213400	Barrier Height
ID and Location	Alt 1	6 ft.
Existing	47.5	48
Build vs. Existing	12.6	13
Achievable Noise Reduction	10	10
Construction after 1978? Or New Construction	No	
Base Allowance (2000 dollars)		17,000
Absolute Noise Levels		
69 or less	2000	2000
70-74 dBA	4000	0
75-78 dBA	6000	0
More than 78 dBA	8000	0
Build vs. Existing Noise Levels		
Less than 3 dBA	0	0
3-7 dBA	2000	0
8-11 dBA	4000	0
12 dBA or More	6000	6000
Achievable Noise Reduction		
Less than 6 dBA	0	0
6-8 dBA	2000	0
9-11 dBA	4000	4000
12 dBA or More	6000	0
Either New Construction or Pre-Date 1978		
Yes	10000	0
No	0	0
Total for Worksheet A, per Receiver:		29,000

Worksheet A		Receptor No.
Project		19
EA	09-213400	Barrier Height
ID and Location	Alt 1	6 ft.
Existing	46.88	47
Build vs. Existing	13.4	13
Achievable Noise Reduction	5.7	6
Construction after 1978? Or New Construction	No	
Base Allowance (2000 dollars)		17,000
Absolute Noise Levels		
69 or less	2000	2000
70-74 dBA	4000	0
75-78 dBA	6000	0
More than 78 dBA	8000	0
Build vs. Existing Noise Levels		
Less than 3 dBA	0	0
3-7 dBA	2000	0
8-11 dBA	4000	0
12 dBA or More	6000	6000
Achievable Noise Reduction		
Less than 6 dBA	0	0
6-8 dBA	2000	2000
9-11 dBA	4000	0
12 dBA or More	6000	0
Either New Construction or Pre-Date 1978		
Yes	10000	0
No	0	0
Total for Worksheet A, per Receiver:		27,000

M e m o r a n d u m

Flex your power!
Be energy efficient!

To: Mathew Palmer
Associate Environmental Planner
Central Sierra Analysis Branch

Date: August 25, 2008

File: EA 09-213400
Inyo-395
PM 30.8/41.8

From: Kenneth J Romero
Chief
Central California Environmental Engineering Branch

Subject: Noise Study Reevaluation for the Inyo-395

Objective

The purpose of this memorandum is to provide an update to the July 24, 2003 noise study for State Route 395 (post miles 30.8 to 41.8), Attachment F, due to the addition of two build alternatives (Alternatives 2A and 4) below.

Project Description

The California Department of Transportation is proposing a new four-lane highway in Inyo County on U.S. Highway 395 near the towns of Olancha and Cartago. The project extends from the existing four-lane highway segment just south of the Los Angeles Aqueduct Bridge No. 48-10 at post mile 30.8 north to the four-lane segment at the Ash Creek Bridge No. 48-11 at post mile 41.8. The project is approximately 11.1 miles long. Five build alternatives and a no-build alternative are being considered.

Alternative 1

This alternative proposes constructing segments of conventional all-paved, conventional divided, and controlled access four-lane divided highway. The project will provide for route continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

South End of the Project – Sage Flat Four-Lane (0.15 miles south of LA Aqueduct Bridge #48-10 PM 30.8) - Controlled access four-lane divided highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west, separated by a 100-foot median.

0.6 mile south of Cactus Flat Road (PM 32.1) - Conventional all-paved four-lane highway is proposed. The existing highway will be widened with northbound and southbound lanes separated by a 14-foot two-way left-turn lane (TWLTL).

1 mile north of the State Route 190 junction (PM 35.7) - Conventional divided four-lane highway is proposed. The existing highway will be widened to the west with northbound and southbound lanes separated by a 100-foot unpaved median. An at-grade crossing and acceleration and deceleration lanes will be provided for truck traffic at the bottling plant. Access control will be purchased along the western right-of-way.

0.45 mile south of Whitney Street (PM 37.4) - Conventional four-lane highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west, separated by a 14-foot two-way left-turn lane (TWLTL).

0.4 mile north of Whitney Street (PM 38.2) - Controlled access four-lane divided highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the east separated by at least a 100-foot median. Lanes will be constructed to avoid existing steel transmission line towers.

2.2 miles north of Whitney Street (PM 40.0) - Controlled access four-lane divided highway is proposed. The existing lanes will be used for southbound traffic, and new northbound lanes will be constructed to the east, separated by at least a 100-foot median.

North end of project – Join with Ash Creek Four-Lane (0.4 mile south of Ash Creek Bridge #48-11) (PM 41.8) - Olancha and Cartago consist primarily of residential units. Olancha is situated mostly west of 395, and Cartago is mostly east of existing 395. Cartago has a honey warehouse and a water bottling plant just south of the community. With improvements along the existing alignment, both communities will be affected due to the narrowness of the existing right-of-way.

Alternative 2

This alternative proposes construction of a controlled-access four-lane divided expressway with the northbound and southbound lanes separated by at least a 100-foot-wide median throughout the project. The project will provide for route continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

South end of the project – Sage Flat Four-Lane (0.15 mile south of LA Aqueduct Bridge #48-10) (PM 30.8) - Controlled access four-lane divided highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west.

1.1 miles south of Cactus Flat Road (PM 31.6) - New northbound and southbound lanes will be constructed to the east of the existing highway, and the existing highway will be used as a frontage road.

0.2 mile south of the Junction of State Route 190 (PM 34.5) - New northbound and southbound lanes will be constructed to the west of the existing highway. The existing highway will be used as a frontage road.

0.7 mile south of Whitney Street (PM 37.1) - Existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west.

0.4 mile north of Whitney Street (PM 38.2) - Similar to Alternative 1.

North end of project – Join with Ash Creek Four-Lane (0.4 mile south of Ash Creek Bridge #48-11) PM 41.8.

Alternative 2A

This alternative is a variation of Alternative 2 and proposes that the controlled-access divided four-lane expressway be constructed to the west of the community of Cartago, with the northbound and southbound lanes separated by at least a 100-foot-wide median throughout.

South end of the project – Sage Flat Four-Lane (0.15 mile south of LA Aqueduct Bridge #48-10 PM 30.8) - Similar to Alternative 2.

1 mile north of the State Route 190 junction (PM 35.7) - Proposed that the new northbound and southbound lanes be constructed to the west of the community of Cartago.

0.8 mile north of Whitney Street (PM 38.6) - Similar to Alternative 1.

North end of project – Join with Ash Creek Four-Lane (0.4 mile south of Ash Creek Bridge #48-11) PM 41.8.

Alternative 3

This alternative proposes construction of a controlled-access divided four-lane expressway to the west of the community of Olancha, with the northbound and southbound lanes separated by at least a 100-foot-wide median throughout the project. The project will provide for route continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

South end of the project – Sage Flat Four-Lane (0.15 mile south of LA Aqueduct Bridge #48-10 PM 30.8) - Existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west.

0.5 mile south of Cactus Flat Road (PM 32.2) - New northbound and southbound lanes are proposed to be constructed to the west of the community of Olancha, near the LA Aqueduct. The junction with State Route 190 will be extended to the west to connect with the new lanes. A CTC-approved Route Redesignation is required if the terminus of SR 190 is altered by Alternative 3.

0.6 mile north of Whitney Street (PM 37.2) - Similar to Alternative 1.

North end of project – Join with Ash Creek Four-Lane (0.4 mile south of Ash Creek Bridge #48-11) PM 41.8.

Alternative 4

South end of the project – Sage Flat Four-Lane (1.1 miles south of LA Aqueduct Bridge #48-10 PM 30.8) – Alternative 4 will be two lanes northbound and two lanes southbound, with a 100-foot unpaved median from PM 29.75 to north of Cartago. North of Cartago, the median will vary so as to thread existing utilities. Shoulders will be 10 feet outside and 5 feet inside, with a 20-foot clear recovery zone inboard and outboard. All curves are a 3,800-foot radius or larger. This alignment will eliminate a small group of trees and a spring as it is. Land taken is almost entirely agency land (Bureau of Land Management, Forest service, LA Department of Water and Power). Access will be controlled by a right-of-way fence. The new road will bear west of the current alignment at PM 29.75 and tie in approximately with the old railroad grade. The road will continue north along the west side of the LA Aqueduct. At a point just west of Cartago, the road will bridge the aqueduct and angle back into the current alignment at PM 41.8.

Highway 190 will be extended along Fall Road, bridge the aqueduct and tie into this alignment (Alternative 4) with at-grade crossings. A CTC-approved Route Redesignation is required if the terminus of SR 190 is altered by Alternative 3 or 4.

Access control will be purchased, and the route will be designated as expressway. All Inyo 395 from start to end will be relinquished to Inyo County. Because this is a new alignment, the route will require adoption by the CTC. The new alignment will be denominated as “Controlled Access Highway.”

North end of project – Join with Ash Creek Four-Lane (0.4 mile south of Ash Creek Bridge #48-11) PM 41.8

No-Build Alternative

This alternative is the “No-Build” option and proposes to leave the facility as it currently exists. This alternative does not provide relief from the existing deficiencies or address the operational improvements this project seeks to deliver.

Noise Analysis and Re-evaluation

The previous noise study discussed the noise impact due to Alternatives 1, 2 and 3, plus the No-Build Alternative. Alternatives 2A and 4 have been added and are now covered in this amendment.

Traffic Data

Future traffic data was obtained from District 9 Traffic Engineering and Planning Branch; the traffic data is listed in the table below:

Table 1. Traffic Forecast Data for the Proposed SR 395 PM 30.8/41.8

Year	DHV*	Total Truck Percentage (%)
2006	1024	21.5
2034	1390	21.5

* Daily Hourly Volumes

The following traffic distribution/speeds were used for the noise analysis:

Automobile traffic = 78.5 percent of peak-hour traffic/55 mph.

Medium Truck Traffic = 30.65 percent of total truck percentage for peak-hour traffic/55 mph.

Heavy Truck Traffic = 69.35 percent of total truck percentage for peak-hour traffic/50 mph.

Scope of Work

As noted in the above project description, two proposed build alternatives have been added for consideration since the original noise study was prepared: Alternative 2A and Alternative 4.

Alternatives 1, 2 and 3 were discussed in the original 2003 Noise Study Report, which is attached to this memo. The study concluded that noise levels for receivers within the project limits did not exceed or approach the noise abatement criteria; it also concluded that the noise levels at a few receivers within the project limits are expected to be substantial, above 12 dBA. Refer to Table 6d of the attached 2003

Noise Study Report for more information. However, the abatements recommended were not feasible or reasonable at those locations; refer to the conclusion on page 24 of the report.

A field visit to the project area revealed new receivers that were not included in the previous noise study. Refer to Figure 1 in Attachment A and Table 2 below for more details. Only receiver 47, which represents the residence at 641 School Rd., appears to be potentially affected if Alternative 3 were to be selected. Sound 32 model was used to estimate the predicted noise level at this receiver.

Table 2. New Receivers Within Project Limits

Receiver ID No.	Type, Location or Address	Activity Category and NAC, Leq (h)
38	123 Olancha Lane – SFR	67
41	295 West Lake St. - SFR	67
42	61 Pine St. - SFR	67
43	300 West Lake St. - SFR	67
44	SFR south of R3	67
45	497 Lacy Lang - SFR	67
46	508 Williams Rd. - SFR	67
47	641 School Rd.-SFR	67
48	970 Wiliams Rd. - SFR	67
49	950 Wiliams Rd. - SFR	67
50	695 HWY 395 – SFR	67
51	2974 South HWY 395 - SFR	67

Background and Re-evaluation for the Original Noise Study

The original Noise Study was based on a traffic forecast that assumes truck percentages of 8.7% of the total traffic mix (refer to Table 3), which is less than the future traffic data obtained recently from District 9, which showed a truck percentage of 21.5%. Refer to Table 1.

Table 3. Traffic Used in the 2003 Noise Study

Year	DHV	Total truck percentage (%)
2005	1071	8.7
2032	1400	8.7

* Daily Hourly Volumes

A comparison of Tables 1 and 3 above shows that the difference in truck percentages will reflect on the noise levels generated by the original noise study. For that purpose, the noise levels were updated using a logarithmic conversion (refer to Attachment D). The calculations produced an increase of 1.9 dBA over the noise levels in the 2003 Noise Study. The results are listed in Table 4 below for comparison to the previous data provided in the 2003 noise analysis:

Table 4: Existing and Post-Project Noise Levels for Alternatives 1, 2 and 3

Receiver #	Development Type	NAC	Existing Noise Level (dBA)	Alternative 1 (dBA)	Increase over existing	Alternative 2 (dBA)	Increase over existing	Alternative 3 (dBA)	Increase over existing
1	Residential	67	44.8	58.1	**13.3**	50	5.2	58.4	**13.6**
2	Commercial	72	49.4	62	**12.6**	50.1	0.7	64.2	**14.8**
3	Residential	67	57.7	58.5	0.8	53.2	-4.5	57.2	-0.5
4	Residential	67	44.6	47.6	3	57	**12.4**	48.3	3.7
5	Residential	67	40.6	52	11.4	59.2	**18.6**	43.6	3
6	Residential	67	48.8	53.7	4.9	61.7	**12.9**	42.1	-6.7
7	Residential	67	54.9	64.3	9.4	54.1	-0.8	39.5	-15.4
8	Residential	67	49.1	55.4	6.3	50.9	1.8	40.6	-8.5
9	Residential	67	40.8	43.2	2.4	47.5	6.7	56	15.2
10	Residential	67	40.8	44.4	3.6	47.3	6.5	51	10.2
11	Residential	67	52.4	49.6	-2.8	47.4	-5	42.5	-9.9
12	Residential	67	38.0	44.4	6.4	45.6	7.6	41.2	3.2
13	Residential	67	51.8	62.6	10.8	62.4	10.6	50.2	-1.6
14	Residential	67	58.4	58.6	0.2	60.7	2.3	51.6	-6.8
15	Residential	67	53.4	62.6	9.2	62.4	9	55	1.6
16	Residential	67	61.4	57.9	-3.5	60.5	-0.9	58.5	-2.9
17	Residential	67	57.7	67.1	9.4	53.2	-4.5	61.2	3.5
18	Residential	67	44.6	51.6	7	57	**12.4**	44.7	0.1
19	Residential	67	48.8	62.2	**13.4**	62.1	**13.3**	41.5	-7.3
20	Residential	67	44.6	45.9	1.3	57	**12.4**	49.6	5
21	Residential	67	54.9	58.1	3.2	54.1	-0.8	40.2	-14.7
22	Residential	67	54.9	60.7	5.8	54.1	-0.8	39.8	-15.1
23	Residential	67	54.9	60.1	5.2	54.1	-0.8	39.9	-15
24	Residential	67	54.9	55.9	1	54.1	-0.8	40.1	-14.8
25	Residential	67	54.9	53.7	-1.2	54.1	-0.8	40.3	-14.6
26	Residential	67	38.0	61.6	**23.6**	45.6	7.6	37.9	-0.1
27	Residential	67	38.0	54.7	16.7	45.6	7.6	39.5	1.5
28	Residential	67	38.0	49.6	11.6	45.6	7.6	41	3
29	Residential	67	38.0	48.5	10.5	45.6	7.6	40.9	2.9
30	Residential	67	38.0	55.6	**17.6**	45.6	7.6	36	-2
31	Residential	67	38.0	53.8	**15.8**	45.6	7.6	37.3	-0.7
32	Residential	67	38.0	48.1	10.1	45.6	7.6	39.8	1.8
33	Residential	67	38.0	47.1	9.1	45.6	7.6	38.6	0.6
34	Residential	67	38.0	51.5	**13.5**	45.6	7.6	36	-2
35	Residential	67	40.8	44.6	3.8	47.5	6.7	49.4	8.6
36	Residential	67	40.8	42.9	2.1	47.5	6.7	56.4	**15.6**
37	Residential	67	40.8	42.6	1.8	47.5	6.7	58.5	**17.7**
38	Residential	67	54.9	56.4	1.5	54.1	-0.8	40.5	-14.4
39	Residential	67	54.9	58.2	3.3	54.1	-0.8	40.1	-14.8
40	Residential	67	38.0	51.2	**13.2**	59.4	**21.4**	50.6	**12.6**
47*	641 School Rd.	67	43.8	N/A	N/A	N/A	N/A	63.2	**19.4**

Bold numbers indicate substantial noise levels

* Refers to recent development (SFR)

Table 4 shows that after the logarithmic adjustment has been applied to the affected receivers in the original Noise Study, all the proposed alternatives in that study, Alternatives 1, 2 and 3, will result in a substantial noise level increase at some potentially affected receivers. However, none of the alternatives will result in a severe noise impact, above 30 dBA, or a noise level above the Noise Abatement Criteria, NAC, at any of the studied receivers. This conclusion coincides with the 2003 report. The 2003 Noise Report stated that soundwalls near the affected sites would not be feasible or reasonable, refer to the attached 2003 Noise Report for more details.

Table 4 also shows that the new modeled receiver close to the Alternative 3 alignment, receiver 47, will have a substantial increase in noise level, above 12 dBA, due to its closeness to the Alternative 3 alignment (refer to Attachment A-Figure 1). A soundwall that has a maximum height and length of 16 feet and 1,349 feet, respectively, was proposed in the original Noise Study as Barrier # 3. This soundwall was proposed in order to attenuate the noise levels at receivers 36 and 37. Since receiver 47 is located south of receiver 37 (refer to Figure 1), it would be appropriate to try different heights of the proposed soundwall in the original noise model, sound 32, in order to obtain the required 5 dBA noise reduction at receiver 47. Table 5 shows that increased heights will only benefit receivers 37 and 47 due to their closeness to the soundwall. Receiver 36 will not benfit from this soundwall because it is located farther from the soundwall (refer to Attachment B-Figure 3). Therefore, the 8-foot-high soundwall was selected because it will be sufficient to reach the minimum 5 dBA noise reduction near receivers 37 and 47.

Table 5: Future Noise Levels and Insertion Losses for Soundwall 1

Receptor # and Location	Existing Noise Level (dBA)	Predicted Noise Level with Project (dBA)	Predicted Noise Level with Abatement (dBA)							
			6-foot Wall*	I.L	8-foot Wall*	I.L	10-foot Wall*	I.L	12-foot Wall	I.L
R36	40.8	56.4	55.9	0.5	55.8	0.6	55.4	1.0	55.0	1.4
R37	40.8	58.5	53.9	4.6	53.1	5.4	52.4	6.1	51.7	6.8
R47	43.8	63.2	51.5	11.7	51.0	12.2	50.6	12.6	50.3	12.9

Table 6 shows a cost for this soundwall of approximately **$281,000** based on a cost of $26 per square foot for a soundwall. The reasonable allowance for receivers 37 and 47 is $54,000 each for a total of $108,000. Refer to worksheets A1 and A2 in Attachment C. Since the predicted soundwall cost exceeds the reasonable allowance, it is not reasonable to build a soundwall at this location for either alternative.

Noise abatement at this location is NOT recommended.

Table 6: Existing and Post-Project Noise Levels

Receiver	Number of Benefited Residences	Total Reasonable Allowance	Estimated Construction Cost (to the nearest $1)	No Wall dBA (Leq)	With Wall dBA (Leq)	Noise Reduction dBA (Leq)	Reasonable/ Feasible? (y/n)
R37	1	$54,000	$281,000	58.5	53.1	5.4	N
R47	1	$54,000	$281,000	63.2	51.0	12.2	N
Total	2	$108,000	$281,000				N

Analysis for Alternatives 2A and 4

***Alternative 2A receivers**:* The existing and future/predicted noise levels for the affected receivers are shown in Table 7 below. It should be mentioned here that Table 7 includes receivers from the 2003 Noise Study that are located close to Alternative 2A alignment. Those receivers are 6, 15, 16, 21, 22, 23, 38 and 39. For a more accurate comparison with future noise levels, the FHWA-approved TNM 2.5 noise model was used to calculate the existing noise levels for all the receivers in Table 7.

Table 7: Existing and Post-Project Noise Levels

Receiver ID No.	Type, Location or Address	Activity Category and NAC, Leq (h)	Existing noise level Leq(h) dBA	Predicted noise Level for Year 2034	Noise Increase (+) or Decrease (-)
6	601 HWY 395 – SFR	67	51.9	57.6	5.7
13	2079 S HWY 395 – Ranch Motel	67	61.6	59	-2.6
15	2245 S HWY 395 - RV Park front	67	62.4	59.3	-3.1
16	2245 S HWY 395 - RV Park back	67	53.5	52.8	-0.7
21	95 Shop St. 2nd- SFR	67	55.5	58.1	2.6
22	45 Shop St. 1st – SFR	67	59.6	64.5	4.9
23	45 Shop St. 2nd -SFR	67	58	63.3	5.3
26	123 Olancha Lane - Motel	67	60.6	58.7	-1.9
38	121 Shop St. – SFR	67	53.2	54.9	1.7
39	95 Shop St. 1st – SFR	67	56	57.9	1.9
41	295 West Lake St. -SFR	67	27.4	53.3	**25.9**
42	61 Pine St.- SFR	67	27.3	52.4	**25.1**
43	300 West Lake St. - SFR	67	27.4	42.5	**15.1**
50	695 HWY 395 -SFR	67	53.6	53	-0.6

Bold numbers refer to substantial noise levels

Table 7 shows the following:

- Receivers 41, 42, and 43 experience a substantial increase in noise levels due to the new location of Alternative 2A alignment. Refer to Figure 2 in Attachment A. A noise impact resulting from a substantial noise increase may additionally be a significant adverse environmental effect. The additional process leading to a noise abatement or mitigation decision for a significant environmental effect (CEQA process) is reported in the draft environmental documentation as appropriate. The final noise abatement/mitigation decision process, described in Section 4 of

Caltrans Traffic Noise Analysis Protocol August, 2006, occurs after the input from affected residents and local agencies, and after consideration of social, economic, environmental, legal, and technological factors. A soundwall with an approximate height and length of 14 feet and 2,512 feet, respectively, would be required to minimize the noise levels at these locations by the minimum 5 dBA, as seen in Table 8. The proposed location of this soundwall would be 50 feet west of the edge of traveled way of the Alternative 2A alignment, extending north from 790 feet south of receiver 43. Refer to Figure 4 in Attachment B.

Table 8. Results of Soundwall 2 Analyses

Receiver	Length (feet)	Height (feet)	NAC dBA (Leq)	No Wall dBA (Leq)	With Wall dBA (Leq)	Noise Reduction dBA (Leq)
R41	2,512	14	67	53.3	48.3	5.0
R42	2,512	14	67	52.4	47.3	5.1
R43	2,512	14	67	42.5	36.9	5.6

This soundwall would have a cost of approximately $915,000, based on a cost of $26 per square foot. The reasonable allowance per benefited residence at this location is estimated at $54,000, for a total allowance of $162,000 as shown in Attachment C (Worksheets A3, A4 and A5) and Table 9 below.

Table 9. Results of Soundwall 2 Feasibility/Reasonableness Analyses

Receiver	Number of Benefited Residences	Total Reasonable Allowance	Estimated Construction Cost (to the nearest $1)	No Wall dBA (Leq)	With Wall dBA (Leq)	Noise Reduction dBA (Leq)	Reasonable/ Feasible? (y/n)
R41	1	$54,000	$900,000	53.3	48.3	48.3	N
R42	1	$54,000	$900,000	52.4	47.3	47.3	N
R43	1	$54,000	$900,000	42.5	36.9	36.9	N
Total	3	$162,000	$900,000				N

Since the predicted soundwall cost exceeds the reasonable allowance, it is not reasonable to build a soundwall at this location.

Noise abatement at this location is NOT recommended.

- Receivers 13, 15, 16, 26 and 50 are set farther from Alternative 2A alignment therefore they experience a change in noise levels ranging from –2.6 dBA to –0.6 dBA. Refer to Figure 2 in Attachment A.
- Receivers 6, 21, 22, 23, 38 and 39 will experience an increase in noise levels between 1.7 dBA and 5.7 dBA. This increase is not substantial and the future increase in noise levels for these receivers are still below the NAC for a residence.

Alternative 4 receivers: This alternative is located farther than 500 feet from homes within the project area. Refer to Figure 1 in Attachment A for more details. Therefore, no noise impact is predicted for this alternative.

Construction Noise

Noise at the construction site would be intermittent, and its intensity would vary. The degree of construction noise impacts may vary for different areas of the project site and vary depending on the construction activities. Highway construction is accomplished in several different phases. These phases and their estimated overall noise levels at the right-of-way can be characterized by the following (Federal Highway Administration, 1977):

Phase	Leq(dBA) at 15m/30m from Source
Clearing and grubbing	86/83
Earthwork	88/85
Foundation	85/82
Base Preparation	88/85
Paving	89/86

Existing noise levels can be compared with the expected noise levels produced by various construction activities to assess construction noise impacts. During the construction period, sensitive receptors that are close to the highway may experience temporary impacts.

The following control measures should be implemented to minimize noise and vibration disturbances at sensitive receptors during periods of construction.

Equipment Noise Control

1. Use newer, or well-maintained, equipment with improved muffling and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine enclosures, and engine vibration isolators intact and operational. Newer equipment will generally be quieter in operation than older equipment. All construction equipment should be inspected at periodic intervals to ensure proper maintenance and presence of noise control devices (e.g., mufflers and shrouding, etc.).

2. Use construction methods or equipment that will provide the lowest level of noise and ground vibration impact such as alternative low noise pile installation methods.

3. Turn off idling equipment.

4. Temporary noise barriers shall be used and relocated, as needed, to protect sensitive receptors against excessive noise from construction activities. Noise barriers can be made of heavy plywood or moveable insulated sound blankets.

Administrative Measures

1. Implement a construction noise- and vibration-monitoring program to limit the impacts.

2. Plan noisier operations during times of least sensitivity to receptors.

3. Keep noise levels relatively uniform and avoid impulsive noises.

4. Maintain good public relations with the community to minimize objections to the unavoidable construction impacts. Provide frequent activity update of all construction activities.

A combination of abatement techniques with equipment noise control and administrative measures can be selected to provide the most effective means to minimize effects of construction activity impacts. Application of abatement measures will reduce the construction impacts; however, temporary increase in noise and vibration will likely occur.

This noise study concludes that no further investigation is needed in order to proceed with the proposed project. Should the project design concept or scope change, please request another investigation for this project.

Conclusions and recommendations:

The difference in traffic forecast data from current and pervious studies resulted in an increase of only 1.9 dBA above the predicted noise levels in the 2003 Noise Study. As a result, this minor increase in noise levels did not change the conclusion established by the previous noise report as discussed above.

Alternatives 2A and 4 have been discussed in this memo. Only Alternative 2A is found to generate a noise impact on adjacent receivers within the project limits. The impacts for all the receivers are below the NAC of 67 dBA for residences. Four receivers discussed in this memo will experience a substantial noise increase, however the abatements proposed for these receivers were found to be not reasonable.

At this time, no further noise analysis is needed. If you have questions or comments, please contact Allam Alhabaly, Trans. Engineer, at (559) 243-8227.

References

Technical Noise Supplement (TENS), 1998.

Traffic Noise Analysis Protocol, August 2006.

Highway Design Manual, 5th Edition Chapter 1100.

FHWA, 1977. Highway Construction Noise: Measurement, Prediction and Mitigation by J.A. Reagan and C.A. Grant, May 2.

FHWA, 1982a. Federal Aided Program Manual, Volume 7, Right Of Way and Environment; Chapter 7, Environment; Section 3, Procedures for Abatement of Highway Traffic Noise and Construction Noise (FHPM 7-7-3).

FHWA, 2004. Noise Barrier Cost Reduction Procedure TNM 2.5.

Glossary

Benefited residence – A dwelling unit expected to receive a noise reduction of at least 5 dBA from the proposed noise abatement measure. A multi-story residence counts as one benefited residence even if the proposed noise abatement provides 5 dBA for the exterior (e.g., balconies) of two or more floors. The definition is primarily used in the determination of noise abatement reasonableness.

dBA, dB(A) – Unit of sound pressure level in decibels on the “A-weighted” scale.

Existing noise level(s) – The noise, resulting from the natural and mechanical sources and human activity, considered normally present in a particular area.

FHWA Type I Project – A proposed federal or federal-aid highway project for the construction of a highway on a new location, or the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes. Caltrans extends this Type I definition to state highway projects without federal funding.

Insertion Loss (IL) – The actual noise level reduction at a specific receiver due to construction of a noise barrier between the noise source (traffic) and the receiver. Generally, it is the net effect of the (noise) barrier’s attenuation and the loss of ground effects.

Affected receivers – Receivers that will receive a traffic noise impact.

Leq – The equivalent steady state sound level that in a stated period of time would contain the same acoustical energy as the time-varying sound level during the same period.

Leq (h) – The energy-average of the A-weighted sound levels occurring during a one-hour period, in decibels (i.e., a one hour Leq (see Leq)).

Noise Abatement – Noise attenuation provided for non-significant adverse environmental effects due to noise.

Noise Mitigation – Noise attenuation provided for significant adverse environmental effects due to noise.

Predicted noise level(s) – Future noise levels, resulting from the natural and mechanical sources and human activity, considered being usually present in a particular area, including the project.

Receivers – Locations selected for determining traffic noise impacts. These locations should represent areas where frequent human use occurs or is likely to occur in the foreseeable future (e.g., vacant property for which development plans have received final approval).

Traffic Noise Impact – Impact that occurs at a receiver when one or both of the following takes place: 1) The predicted noise level substantially exceeds the existing noise level. 2) The predicted noise level associated with the project approaches or exceeds the Noise Abatement Criteria (NAC).

Traffic Mix – Light (L): vehicles having two axles and four wheels; Medium (M): vehicles having two axles and six wheels; Heavy (H): vehicles having three or more axles.

Units of Measurement – Kilometers per hour (km/h), miles per hour (mp/h), meters per second (mps), minutes (min), degrees Celsius (° C), and meters (m).

M e m o r a n d u m

Flex your power efficient!

To: Mathew Palmer
Associate Environmental Planner
Central Sierra Analysis Branch

Date: April 23, 2010

File: EA 09-213400
Inyo-395
PM 30.8/41.8

From: Kenneth J Romero
Chief
Central California Environmental Engineering Branch

Subject: Noise Study Reevaluation for the Inyo-395

Objective

The purpose of this memorandum is to provide an update to the July 24, 2003 noise study for State Route 395 (post miles 30.8 to 41.8), Attachment F, due to the addition of two build alternatives (Alternatives 2A and 4) below.

Project Description

The California Department of Transportation is proposing a new four-lane highway in Inyo County on U.S. Highway 395 near the towns of Olancha and Cartago. The project extends from the existing four-lane highway segment just south of the Los Angeles Aqueduct Bridge No. 48-10 at post mile 30.8 north to the four-lane segment at the Ash Creek Bridge No. 48-11 at post mile 41.8. The project is approximately 11.1 miles long. Five build alternatives and a no-build alternative are being considered.

Alternative 1

This alternative proposes constructing segments of conventional all-paved, conventional divided, and controlled access four-lane divided highway. The project will provide for route continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

South End of the Project – Sage Flat Four-Lane (0.15 mile south of LA Aqueduct Bridge #48-10 PM 30.8) - Controlled access four-lane divided highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west, separated by a 100-foot median.

0.6 mile south of Cactus Flat Road (PM 32.1) - Conventional all-paved four-lane highway is proposed. The existing highway will be widened with northbound and southbound lanes separated by a 14-foot two-way left-turn lane (TWLTL).

1 mile north of the State Route 190 junction (PM 35.7) - Conventional divided four-lane highway is proposed. The existing highway will be widened to the west with northbound and southbound lanes separated by a 100-foot unpaved median. An at-grade crossing and acceleration and deceleration lanes will be provided for truck traffic at the bottling plant. Access control will be purchased along the western right-of-way.

0.45 mile south of Whitney Street (PM 37.4) - Conventional four-lane highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west, separated by a 14-foot two-way left-turn lane (TWLTL).

0.4 mile north of Whitney Street (PM 38.2) - Controlled access four-lane divided highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the east separated by at least a 100-foot median. Lanes will be constructed to avoid existing steel transmission line towers.

2.2 miles north of Whitney Street (PM 40.0) - Controlled access four-lane divided highway is proposed. The existing lanes will be used for southbound traffic, and new northbound lanes will be constructed to the east, separated by at least a 100-foot median.

North end of project – Join with Ash Creek Four-Lane (0.4 mile south of Ash Creek Bridge #48-11) (PM 41.8) - Olancha and Cartago consist primarily of residential units. Olancha is situated mostly west of 395, and Cartago is mostly east of existing 395. Cartago has a honey warehouse and a water bottling plant just south of the community. With improvements along the existing alignment, both communities will be affected due to the narrowness of the existing right-of-way.

Alternative 2

This alternative proposes construction of a controlled-access four-lane divided expressway with the northbound and southbound lanes separated by at least a 100-foot-wide median throughout the project. The project will provide for route continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

South end of the project – Sage Flat Four-Lane (0.15 mile south of LA Aqueduct Bridge #48-10) (PM 30.8) - Controlled access four-lane divided highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west.

1.1 miles south of Cactus Flat Road (PM 31.6) - New northbound and southbound lanes will be constructed to the east of the existing highway, and the existing highway will be used as a frontage road.

0.2 mile south of the Junction of State Route 190 (PM 34.5) - New northbound and southbound lanes will be constructed to the west of the existing highway. The existing highway will be used as a frontage road.

0.7 mile south of Whitney Street (PM 37.1) - Existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west.

0.4 mile north of Whitney Street (PM 38.2) - Similar to Alternative 1.

North end of project – Join with Ash Creek Four-Lane (0.4 mile south of Ash Creek Bridge #48-11) PM 41.8.

Alternative 2A

This alternative is a variation of Alternative 2 and proposes that the controlled-access divided four-lane expressway be constructed to the west of the community of Cartago, with the northbound and southbound lanes separated by at least a 100-foot-wide median throughout.

South end of the project – Sage Flat Four-Lane (0.15 mile south of LA Aqueduct Bridge #48-10 PM 30.8) - Similar to Alternative 2.

1 mile north of the State Route 190 junction (PM 35.7) - Proposed that the new northbound and southbound lanes be constructed to the west of the community of Cartago.

0.8 mile north of Whitney Street (PM 38.6) - Similar to Alternative 1.

North end of project – Join with Ash Creek Four-Lane (0.4 mile south of Ash Creek Bridge #48-11) PM 41.8.

Alternative 3

This alternative proposes construction of a controlled-access divided four-lane expressway to the west of the community of Olancha, with the northbound and southbound lanes separated by at least a 100-foot-wide median throughout the project. The project will provide for route continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

South end of the project – Sage Flat Four-Lane (0.15 mile south of LA Aqueduct Bridge #48-10 PM 30.8) - Existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west.

0.5 mile south of Cactus Flat Road (PM 32.2) - New northbound and southbound lanes are proposed to be constructed to the west of the community of Olancha, near the LA Aqueduct. The junction with State Route 190 will be extended to the west to connect with the new lanes. A CTC-approved Route Redesignation is required if the terminus of SR 190 is altered by Alternative 3.

0.6 mile north of Whitney Street (PM 37.2) - Similar to Alternative 1.

North end of project – Join with Ash Creek Four-Lane (0.4 mile south of Ash Creek Bridge #48-11) PM 41.8.

Alternative 4

South end of the project – Sage Flat Four-Lane (1.1 miles south of LA Aqueduct Bridge #48-10 PM 30.8) – Alternative 4 will be two lanes northbound and two lanes southbound, with a 100-foot unpaved median from PM 29.75 to north of Cartago. North of Cartago, the median will vary so as to thread existing utilities. Shoulders will be 10 feet outside and 5 feet inside, with a 20-foot clear recovery zone inboard and outboard. All curves are a 3,800-foot radius or larger. This alignment will eliminate a small group of trees and a spring as it is. Land taken is almost entirely agency land (Bureau of Land Management, Forest service, LA Department of Water and Power). Access will be controlled by a right-of-way fence. The new road will bear west of the current alignment at PM 29.75 and tie in approximately with the old railroad grade. The road will continue north along the west side of the LA Aqueduct. At a point just west of Cartago, the road will bridge the aqueduct and angle back into the current alignment at PM 41.8.

Highway 190 will be extended along Fall Road, bridge the aqueduct and tie into this alignment (Alternative 4) with at-grade crossings. A CTC-approved Route Redesignation is required if the terminus of SR 190 is altered by Alternative 3 or 4.

Access control will be purchased, and the route will be designated as expressway. All Inyo 395 from start to end will be relinquished to Inyo County. Because this is a new alignment, the route will require adoption by the CTC. The new alignment will be denominated as “Controlled Access Highway.”

North end of project – Join with Ash Creek Four-Lane (0.4 mile south of Ash Creek Bridge #48-11) PM 41.8

No-Build Alternative

This alternative is the “No-Build” option and proposes to leave the facility as it currently exists. This alternative does not provide relief from the existing deficiencies or address the operational improvements this project seeks to deliver.

Noise Analysis and Re-evaluation

The previous noise study discussed the noise impact due to Alternatives 1, 2 and 3, plus the No-Build Alternative. Alternatives 2A and 4 have been added and are now covered in this amendment.

Traffic Data

Future traffic data (for design year 2034) was obtained from District 9 Traffic Engineering and Planning Branch (refer to Attachment C); the traffic data is listed in the table below:

Table 1. Traffic Forecast Data (Design Year 2034)

Year	DHV*	Total Truck Percentage (%)
2006	1055	21.5
2034	1390	21.5

* Daily Hourly Volumes

The following traffic distribution/speeds were used for the noise analysis:

Automobile traffic = 78.5% of peak-hour traffic/55 mph.

Medium Truck Traffic = 30.65% of total truck percentage for peak-hour traffic/55 mph.

Heavy Truck Traffic = 69.35% of total truck percentage for peak-hour traffic/50 mph.

Scope of Work

As noted in the above project description, two proposed build alternatives have been added for consideration since the original noise study was prepared: Alternative 2A and Alternative 4.

Alternatives 1, 2 and 3 were discussed in the original 2003 Noise Study Report, which is attached to this memo. The study concluded that noise levels for receptors within the project limits did not exceed or approach the noise abatement criteria; it also concluded that the noise levels at a few receptors within the project limits are expected to be substantial, above 12 dBA. Refer to Table 6d of the attached 2003 Noise Study Report for more information. However, the abatements recommended were not feasible or reasonable at those locations; refer to the conclusion on page 16 of the report.

A field visit to the project area revealed a total of 5 receptors that were not included in the previous noise study. Refer to Figure 1 in Attachment A and Table 2 below for more details. Of the new receptors only receptor 45, which represents the residence at 641 School Rd., appears to be potentially affected if Alternative 3 were to be selected, see Table 6. The new FHWA- approved Noise Model TNM 2.5 was used to estimate the predicted noise level at this receptor.

Table 2. New Receptors Within Project Limits

Receptor ID No.	Type, Location or Address	Activity Category and NAC, Leq (h)
40	295 West Lake St. 1st - SFR	67
41	295 West Lake St. 2nd - SFR	67
42	300 West Lake St. - SFR	67
43	695 HWY 395 – SFR	67
44	45 Shop Street-SFR	67
45	641 School Rd.-SFR	67

Background and Re-evaluation for the Original Noise Study

The original Noise Study was based on a traffic forecast that assumes truck percentages of 8.7% of the total traffic mix (refer to Table 3), which is less than the future traffic data (for design year 2034) obtained recently from District 9, which showed a truck percentage of 21.5% (refer to Attachment C).

Table 3. Traffic Used in the 2003 Noise Study

Year	DHV*	Total Truck Percentage (%)
2005	1071	8.7
2032	1270	8.7

* Daily Hourly Volumes

A comparison of Tables 1 and 3 shows a difference in truck percentages. The higher truck percentages mean higher noise levels compared to the original noise study. For that purpose, the noise levels for alternatives 1, 2 and 3 were updated through modeling using the most resent traffic volumes. The results are listed in Tables 4 through 6 below. The FHWA approved Traffic Noise Model TNM 2.5 is used for this modeling. Discussion for each alternative as a result will follow, refer to Attachment E for modeling results.

As stated in Section N-5510, page N-117 of the Tens (Technical Noise Supplement 1998), modeling results are rounded to the nearest decibel before comparisons are made. In some cases, this can result in relative changes that may not appear intuitive. An example would be a comparison between sound levels of 54.4 and 55.5 dBA. The difference between these two values is only 0.1 dBA. However, after rounding, the difference is reported as 1 dBA.

Alternative 1:

Modeling results for this alternative are shown in Table 4 below.

Table 4: Existing, No-Build and Post-Project Noise Levels for Alternative 1

Receptor ID No.	Type, Location or Address	Activity Category and NAC, Leq (h)	Existing noise level Leq(h) dBA	Predicted No-Build noise Levels for (2034)	Predicted Build noise Levels for Alt-1 (2034)	Noise levels No-Build VS existing	Noise levels Build VS existing
R-1	299 S Pine SFR	67	58	58	59	0	1
R-2	Behive Hut in front of R1 Commercial	72	53	53	55	0	2
R-3	Sierra and Whitney St SFR	67	58	59	59	1	1
R-4	497 Lacey Lane SFR	67	40	42	41	2	1
R-5	301 Olanch Lane SFR	67	48	49	51	1	3
R-6	100 Olancha Lane SFR	67	52	53	54	1	2
R-7	Printing business	72	63	65	64	2	1
R-8	Olanch School	67	52	53	54	1	2
R-9	Fall St/Summer ST Intchange SFR	67	40	41	41	1	1
R-10	Near fall St./Summer Rd. SFR	67	41	42	42	1	1
R-11	Near Existing SR-395 SFR	67	45	46	46	1	1
R-12	Deepest home off of Williams Rd. SFR	67	41	42	42	1	1
R-13	Ranch Motel	67	63	64	64	1	1
R-14	Ranch Motel	67	57	58	58	1	1
R-15	Rv Park front	67	63	65	65	2	2
R-16	Rv Park back	67	56	57	58	1	2
R-17	Represented by R3	67	61	62	61	1	0
R-18	Represented by R4	67	46	47	47	1	1
R-19	Represented by R6	67	61	63	63	2	2
R-20	Represented by R4	67	40	41	41	1	1
R-21	Historic School House	67	56	57	57	1	1
R-22	Represented by R7	67	60	61	61	1	1
R-23	Represented by R7	67	60	61	61	1	1
R-24	Represented by R7	67	53	54	55	1	2
R-25	Represented by R7	67	50	51	52	1	2
R-26	Represented by R7	67	61	62	62	1	1
R-27	Represented by R12	67	51	52	52	1	1

Receptor ID No.	Type, Location or Address	Activity Category and NAC, Leq (h)	Existing noise level Leq(h) dBA	Predicted No-Build noise Levels for (2034)	Predicted Build noise Levels for Alt-1 (2034)	Noise levels No-Build VS existing	Noise levels Build VS existing
R-28	Represented by R12	67	45	46	46	1	1
R-29	Represented by R12	67	44	45	45	1	1
R-30	Represented by R12	67	52	53	54	1	2
R-31	Represented by R12	67	50	51	51	1	1
R-32	Represented by R12	67	43	45	45	2	2
R-33	Represented by R12	67	43	44	44	1	1
R-34	Represented by R12	67	47	48	48	1	1
R-35	Represented by R12	67	41	42	42	1	1
R-36	Represented by R9	67	40	41	41	1	1
R-37	Represented by R9	67	40	41	41	1	1
R-38	Represented by R9	67	53	55	55	2	2
R-39	Represented by R7	67	58	59	59	1	1
R-40*	295 West Lake St. first SFR	67	48	49	51	1	3
R-41*	295 West Lake St. second SFR	67	47	48	49	1	2
R-42*	300 West Lake St. SFR	67	46	46	48	0	2
R-43*	45 Shop St. first SFR	67	61	62	62	1	1
R-44*	695 HWY 395 SFR	67	54	55	55	1	1
R-45*	641 School Rd. SFR	67	39	41	41	2	2

Bold numbers indicate substantial noise levels
* Refers to recent development (SFR)

The traffic noise modeling results in Table 4 indicate that traffic noise levels at residences in the vicinity of Alternative 1 alignment are predicted to be in the range of 41 and 65 dBA in the design year 2034. The results also indicate that increase in noise between existing and post project conditions is predicted to be less than substantial (12 or more dBA). Because the predicted noise levels in the design year would not approach or exceed the noise abatement criterion (67 dBA) or result in a substantial increase in noise, noise abatement does not need to be considered for Alternative 1.

Abatement is not recommended at this location.

Alternative 2 receptors:

Modeling results for this alternative are shown in Table 5 below.

Table 5: Existing, Build and Post-Project Noise Levels for Alternative 2

Receptor ID No.	Type, Location or Address	Activity Category and NAC, Leq (h)	Existing noise level Leq(h) dBA	Predicted No-Build noise Levels for (2034)	Predicted Build noise Levels for Alt-2 (2034)	Noise levels No-Build VS existing	Noise levels Build VS existing
R-1	299 S Pine SFR	67	58	58	62	0	4
R-2	Behive Hut in front of R1 Commercial	72	53	53	57	0	4
R-3	Sierra and Whitney St SFR	67	58	59	56	1	-2
R-4	497 Lacey Lane SFR	67	40	42	48	2	8
R-5	301 Olanch Lane SFR	67	48	49	53	1	5
R-6	100 Olancha Lane SFR	67	52	53	59	1	7
R-7	Printing business	72	63	65	68	2	5
R-8	Olanch School	67	52	53	53	1	1
R-9	all St/Summer ST Intchange SFR	67	40	41	42	1	2
R-10	Near fall St./Summer Rd. SFR	67	41	42	42	1	1
R-11	Near Existing SR-395 SFR	67	45	46	46	1	1
R-12	Deepest home off of Williams Rd. SFR	67	41	42	42	1	1
R-13	Ranch Motel	67	63	64	60	1	-3
R-14	Ranch Motel	67	57	58	56	1	-1
R-15	Rv Park front	67	63	65	61	2	-2
R-16	Rv Park back	67	56	57	55	1	-1
R-17	Represented by R3	67	61	62	57	1	-4
R-18	Represented by R4	67	46	47	51	1	5
R-19	Represented by R6	67	61	63	67	2	6
R-20	Represented by R4	67	40	41	44	1	4
R-21	Historic School House	67	56	57	60	1	4
R-22	Represented by R7	67	60	61	63	1	3
R-23	Represented by R7	67	60	61	63	1	3
R-24	Represented by R7	67	53	54	53	1	0
R-25	Represented by R7	67	50	51	52	1	2
R-26	Represented by R7	67	61	62	59	1	-2

Receptor ID No.	Type, Location or Address	Activity Category and NAC, Leq (h)	Existing noise level Leq(h) dBA	Predicted No-Build noise Levels for (2034)	Predicted Build noise Levels for Alt-2 (2034)	Noise levels No-Build VS existing	Noise levels Build VS existing
R-27	Represented by R12	67	51	52	51	1	0
R-28	Represented by R12	67	45	46	46	1	1
R-29	Represented by R12	67	44	45	45	1	1
R-30	Represented by R12	67	52	53	52	1	0
R-31	Represented by R12	67	50	51	50	1	0
R-32	Represented by R12	67	43	45	44	2	1
R-33	Represented by R12	67	43	44	44	1	1
R-34	Represented by R12	67	47	48	47	1	0
R-35	Represented by R12	67	41	42	42	1	1
R-36	Represented by R9	67	40	41	41	1	1
R-37	Represented by R9	67	40	41	41	1	1
R-38	Represented by R9	67	53	55	56	2	3
R-39	Represented by R7	67	58	59	59	1	1
R-40*	295 West Lake St. first SFR	67	48	49	52	1	4
R-41*	295 West Lake St. second SFR	67	47	48	51	1	4
R-42*	300 West Lake St. SFR	67	46	46	49	0	3
R-43*	45 Shop St. first SFR	67	61	62	63	1	2
R-44*	695 HWY 395 SFR	67	54	55	53	1	-1
R-45*	641 School Rd. SFR	67	39	41	41	2	2

Bold numbers indicate substantial noise levels
* Refers to recent development (SFR)

The traffic noise modeling results in Table 5 indicate traffic noise levels at receptors in the vicinity of this alternative are predicted to be in the range of 41 to 68 dBA L_{eq}(h) in the design year 2034. The table shows two impacted receptors R-7 and R-19 that will experience noise levels above the NAC, 68 dBA and 67 dBA respectively. R-19 represents a location for a residence and R-7 represents a printing business; both locations are within the alignment of Alternative 2. These locations will be a take if this alternative is selected.

Table 5 also shows the noise levels at the remaining receptors under the design year build conditions for Alternative 2 will increase above the existing noise levels, this increase is not substantial (12 dBA or greater) and the noise levels will remain below the Noise Abatement Criteria NAC.

Abatement is not recommended at this location.

Alternative 3 receptors:

Modeling results for this alternative are shown in Table 5 below.

Table 6: Existing No-build and Post-Project Noise Levels for Alternative 3

Receptor ID No.	Type, Location or Address	Activity Category and NAC, Leq (h)	Existing noise level Leq(h) dBA	Predicted No-Build noise Levels for (2034)	Predicted Build noise Levels for Alt-3 (2034)	Noise levels No-Build VS existing	Noise levels Build VS existing
R-1	299 S Pine SFR	67	58	58	62	0	4
R-2	Behive Hut in front of R1 Commercial	72	53	53	58	0	5
R-3	Sierra and Whitney St SFR	67	58	59	55	1	-3
R-4	497 Lacey Lane SFR	67	40	42	40	2	0
R-5	301 Olanch Lane SFR	67	48	49	43	1	-5
R-6	100 Olancha Lane SFR	67	52	53	41	1	-11
R-7	Printing business	72	63	65	41	2	-22
R-8	Olanch School	67	52	53	39	1	-13
R-9	Fall St/Summer ST Intchange SFR	67	40	41	54	1	14
R-10	Near fall St./Summer Rd. SFR	67	41	42	49	1	8
R-11	Near Existing SR-395 SFR	67	45	46	42	1	-3
R-12	Deepest home off of Williams Rd. SFR	67	41	42	57	1	16
R-13	Ranch Motel	67	63	64	33	1	-30
R-14	Ranch Motel	67	57	58	33	1	-24
R-15	Rv Park front	67	63	65	31	2	-32
R-16	Rv Park back	67	56	57	32	1	-24
R-17	Represented by R3	67	61	62	57	1	-4
R-18	Represented by R4	67	46	47	37	1	-9
R-19	Represented by R6	67	61	63	40	2	-21
R-20	Represented by R4	67	40	41	37	1	-3
R-21	Historic School House	67	56	57	42	1	-14
R-22	Represented by R7	67	60	61	41	1	-19
R-23	Represented by R7	67	60	61	41	1	-19

Receptor ID No.	Type, Location or Address	Activity Category and NAC, Leq (h)	Existing noise level Leq(h) dBA	Predicted No-Build noise Levels for (2034)	Predicted Build noise Levels for Alt-3 (2034)	Noise levels No-Build VS existing	Noise levels Build VS existing
R-24	Represented by R7	67	53	54	43	1	-10
R-25	Represented by R7	67	50	51	43	1	-7
R-26	Represented by R7	67	61	62	39	1	-22
R-27	Represented by R12	67	51	52	40	1	-11
R-28	Represented by R12	67	45	46	42	1	-3
R-29	Represented by R12	67	44	45	43	1	-1
R-30	Represented by R12	67	52	53	40	1	-12
R-31	Represented by R12	67	50	51	40	1	-10
R-32	Represented by R12	67	43	45	44	2	1
R-33	Represented by R12	67	43	44	47	1	4
R-34	Represented by R12	67	47	48	42	1	-5
R-35	Represented by R12	67	41	42	48	1	7
R-36	Represented by R9+	67	40	41	56	1	**16**
R-37	Represented by R9	67	40	41	58	1	**18**
R-38	Represented by R9	67	53	55	42	2	-11
R-39	Represented by R7	67	56	57	42	1	-14
R-40*	295 West Lake St. first SFR	67	48	49	53	1	5
R-41*	295 West Lake St. second SFR	67	47	48	52	1	5
R-42*	300 West Lake St. SFR	67	46	46	51	0	5
R-43*	45 Shop St. first SFR	67	60	61	41	1	-19
R-44*	695 HWY 395 SFR	67	54	55	40	1	-14
R-45*	641 School Rd. SFR	67	39	41	62	2	**23**

Bold numbers indicate substantial noise levels
* Refers to recent development (SFR)

The traffic noise modeling results in Table 6 indicate traffic noise levels at receptors in the vicinity of this alternative are predicted to be in the range of 31 to 62 dBA L_{eq}(h) in the design year 2034. The table shows five impacted receptors R-9, R-12, R-36, R-37 and R-45 that will experience a substantial noise level increase (substantial refers to increase of 12 or more dBA). The predicted noise levels at these receptors are expected to exceed the existing levels by 14 dBA, 17 dBA, 17 dBA, 18 dBA and 23 dBA, respectively.

A noise impact resulting from a substantial noise increase may additionally be a significant adverse environmental effect. The additional process leading to a noise abatement or mitigation decision for a significant environmental effect (CEQA process) is reported in the draft environmental documentation as appropriate. The final noise abatement/mitigation decision process, described in Section 4 of Caltrans Traffic Noise Analysis Protocol August, 2006, occurs after the input from affected residents and local agencies, and after consideration of social, economic, environmental, legal, and technological factors.

Because predicted noise levels in the design year are substantial traffic noise impacts are predicted at these receptors and noise abatement must be considered.

Barrier 3B

Abatement for R-9 was proposed in the original noise study in the form of a soundwall. Barrier 3B has a length of 177 feet, and heights between 6 feet and 16 feet were analyzed in order to reduce the noise level at this location by the required 5 dBA. The soundwall was not feasible. Refer to original NSR attached.

Receptor R-12: This receptor represents a single-family residence in a rural setting with no other homes close by and set back approximately 351 feet from the edge of traveled way of the proposed alternative alignment. When residences, in rural areas, are scattered, soundwalls are not considered feasible since they will block access to driveways. Any gaps within a soundwall will affect the feasibility of the soundwall. Also since receptor R-12 is set back at a great distance from the edge of traveled way, approximately 351 feet, it will be difficult to achieve the required 5 dBA attenuation and keep the cost reasonable, as demonstrated in Barrier 3B above.

Barrier 3C

Abatement for R-36 and R-37 in the form of a soundwall that has a maximum height and length of 16 feet and 1,349 feet, respectively, was proposed in the original Noise Study as Barrier 3C. This soundwall was proposed in order to attenuate the noise levels at receptors R-36 and R-37. Since receptor R-45 is located south of receptor 37 (refer to Figure 3), it would be appropriate to try different heights of the proposed soundwall in order to obtain the required 5 dBA noise reduction at receptor R-45.

Barrier 3C was remodeled and updated using TNM 2.5 in order to incorporate the new receptor R-45 in the model. Results of the modeling are listed in Table 7 below.

Table 7: Future Noise Levels and Insertion Losses for Barrier 3C

Receptor # and Location	Predicted Noise Level with Project (dBA)	Predicted Noise Level with Abatement (dBA)											
		10-foot Wall*	I.L	12-foot Wall*	I.L	14-foot Wall*	I.L	16-foot Wall*	I.L	18-foot Wall	I.L	20-foot Wall	I.L
R-36	56	56	0	55	2	53	3	53	3	52	4	52	4
R-37	58	58	0	56	2	54	4	54	4	53	5	53	5
R-45	62	59	3	57	6	56	7	55	8	54	8	54	8

Table 7 shows that an 18-foot-high soundwall will reduce the noise levels at receptors R-37 and R-45 by the required 5 dBA since they are located closer to the soundwall than receptor R-36 (refer to Attachment A-Figure 3). Also the table shows that increased wall heights of up to 20 feet will produce the same benefit. Receptor R-36 will not benefit from a 20-foot- high soundwall because it is located farther from the soundwall. Therefore, the recommended height for Barrier 3C is 16 feet.

For the current year (2009-2010), the base allowance for the reasonable cost of a soundwall is $31,000 per protected receptor. This amount can be adjusted as shown in the allowance calculations contained in worksheets B1 through B3 in Attachment B.

Table 8 summarizes the calculated noise reductions and reasonable allowances for each Barrier 3C.

Table 8: Results of Feasibility/Reasonableness Analyses for Barrier 3C

Receptor	Number of Benefited Residences	Total Reasonable Allowance	No Wall dBA (Leq)	With Wall dBA (Leq)	Noise Reduction dBA (Leq)
R-36	0	0	56	52	4
R37	1	$51,000	58	53	5
R45	1	$53,000	62	54	8
Total	3	$104,000	---	---	---

As shown in Table 8, Barrier 3C is capable of achieving the required minimum of 5 dBA at only two locations and provide noise attenuation for receivers R-36, R-37 if Alternative 3 is selected. Barrier 3C would have a height and length of 18 feet and 1308 feet, respectively and would extend from (Northing/Easting) 194684.12/6851650.69 to 1983252.53/6852297.56. Refer to barrier information provided in Attachment D of this amendment report.

A Noise Abatement Decision Report, NADR, will be prepared that will identify noise barrier construction cost information and determine if the noise barrier is reasonable from a cost perspective. In addition, the final location and height will be determined for the barrier.

Analysis for Alternatives 2A and 4

Alternative 2A receptors*:* The existing and future/predicted noise levels for the affected receptors are shown in Table 9.

Table 9: Existing, No-Build and Post-Project Noise Levels for Alternative 2A

Receptor ID No.	Type, Location or Address	Activity Category and NAC, Leq (h)	Existing noise level Leq(h) dBA	Predicted No-Build noise Levels for (2034)	Predicted Build noise Levels for Alt-2A-2034	Noise levels No- Build VS existing	Noise levels Build VS existing
R-1	299 S Pine SFR	67	58	58	49	0	-9
R-2	Behive Hut in front of R1 Commercial	72	53	53	51	0	-2
R-3	Sierra and Whitney St SFR	67	58	59	47	1	-11
R-4	497 Lacey Lane SFR	67	40	42	48	2	8
R-5	301 Olanch Lane SFR	67	48	49	53	1	5
R-6	100 Olancha Lane SFR	67	52	53	59	1	7
R-7	Printing business	67	63	65	**68**	2	5
R-8	Olanch School	67	52	53	53	1	1
R-9	Fall St/Summer ST Intchange SFR	67	40	41	42	1	2
R-10	Near fall St./Summer Rd. SFR	67	41	42	42	1	1
R-11	Near Existing SR-395 SFR	67	45	46	46	1	1
R-12	Deepest home off of Williams Rd. SFR	67	41	42	42	1	1
R-13	Ranch Motel	67	63	64	60	1	-3
R-14	Ranch Motel	67	57	58	56	1	-1
R-15	Rv Park front	67	63	65	61	2	-2
R-16	Rv Park back	67	56	57	55	1	-1
R-17	Represented by R3	67	61	62	47	1	-14
R-18	Represented by R4	67	46	47	51	1	5
R-19	Represented by R6	67	61	63	**67**	2	6
R-20	Represented by R4		40	41	44	1	4
R-21	Historic School House	67	56	57	60	1	4
R-22	Represented by R7	67	60	61	63	1	3

Receptor ID No.	Type, Location or Address	Activity Category and NAC, Leq (h)	Existing noise level Leq(h) dBA	Predicted No-Build noise Levels for (2034)	Predicted Build noise Levels for Alt-2A- 2034	Noise levels No-Build VS existing	Noise levels Build VS existing
R-23	Represented by R7	67	60	61	63	1	3
R-24	Represented by R7	67	53	54	53	1	0
R-25	Represented by R7	67	50	51	52	1	2
R-26	Represented by R7	67	61	62	59	1	-2
R-27	Represented by R12	67	51	52	51	1	0
R-28	Represented by R12	67	45	46	46	1	1
R-29	Represented by R12	67	44	45	45	1	1
R-30	Represented by R12	67	52	53	52	1	0
R-31	Represented by R12	67	50	51	50	1	0
R-32	Represented by R12	67	43	45	44	2	1
R-33	Represented by R12	67	43	44	44	1	1
R-34	Represented by R12	67	47	48	47	1	0
R-35	Represented by R12	67	41	42	42	1	1
R-36	Represented by R9	67	40	41	41	1	1
R-37	Represented by R9	67	40	41	41	1	1
R-38	Represented by R9	67	53	55	56	2	3
R-39	Represented by R7	67	56	57	59	1	3
R-40*	295 West Lake St. first SFR	67	48	49	55	1	7
R-41*	295 West Lake St. second SFR	67	47	48	55	1	8
R-42*	300 West Lake St. SFR	67	46	46	55	0	9
R-43*	45 Shop St. first SFR	67	60	61	63	1	3
R-44*	695 HWY 395 SFR	67	54	55	53	1	-1
R-45*	641 School Rd. SFR	67	39	41	41	2	2

Bold numbers indicate substantial noise levels
* Refers to recent development (SFR)

Table 9 shows two impacted receptors, R-7 and R-19, that will experience noise levels above the NAC, 68 dBA and 67 dBA, respectively. R-19 represents a location for a residence and R-7 represents a printing business; both locations are within the alignment of Alternative 2. These locations will be a take if this alternative is selected.

Table 9 also shows that noise levels at the remaining receptors under the design-year build conditions for Alternative 2A will increase above the existing noise levels. This increase is not substantial (12 dBA or greater), and the noise levels will remain below the Noise Abatement Criteria (NAC).

Abatement is not recommended at this location.

Alternative 4 receptors: This alternative is located farther than 500 feet from homes within the project area. Refer to Figure 1 in Attachment A for more details. TNM computes highway traffic noise at nearby receptors, less than 500 feet from the noise source. Modeling for distances greater than 500 feet will not produce accurate results and noise impacts are normally not predicted at such distances. Therefore, no noise impact is predicted for this alternative.

Construction Noise

Noise at the construction site would be intermittent, and its intensity would vary. The degree of construction noise impacts may vary for different areas of the project site and vary depending on the construction activities. Highway construction is accomplished in several different phases. These phases and their estimated overall noise levels at the right-of-way can be characterized by the following (Federal Highway Administration, 1977):

Phase	Leq(dBA) at 15m/30m from Source
Clearing and grubbing	86/83
Earthwork	88/85
Foundation	85/82
Base Preparation	88/85
Paving	89/86

Existing noise levels can be compared with the expected noise levels produced by various construction activities to assess construction noise impacts. During the construction period, sensitive receptors that are close to the highway may experience temporary impacts.

The following control measures should be implemented to minimize noise and vibration disturbances at sensitive receptors during periods of construction.

Equipment Noise Control

During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Construction noise is regulated by Caltrans Standard Specifications Section 7-1.01I, “Sound Control Requirements,” which states that noise levels generated during construction shall comply with applicable local, state, and federal regulations, and that all equipment shall be fitted with adequate mufflers according to the manufacturers’ specifications.

Table 8-1 summarizes noise levels produced by construction equipment that is commonly used on roadway construction projects. Construction equipment is expected to generate noise levels ranging from 70 to 90 dB at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance.

Table 12. Construction Equipment Noise

Equipment	Maximum Noise Level (dBA at 50 feet)
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic Tools	85
Concrete Pump	82

Source: Federal Transit Administration 1995.

No adverse noise impacts from construction are anticipated because construction would be conducted in accordance with Caltrans Standard Specifications Section 7-1.01I and applicable local noise standards. Construction noise would be short-term, intermittent, and overshadowed by local traffic noise. Further, implementing the following measures would minimize the temporary noise impacts from construction:

- All equipment will have sound-control devices that are no less effective than those provided on the original equipment. No equipment will have an unmuffled exhaust.

- As directed by Caltrans, the contractor will implement appropriate additional noise mitigation measures, including changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources.

Conclusions and recommendations:

Construction of sound barriers would not be feasible or reasonable for the impacted receptors within the project limits because the construction of such barriers would interfere with access to the driveways and local cross-streets that provide access to the properties, and any breaks in the soundwall will render the wall not feasible. Also building such walls is not reasonable since the receivers are few and spread out along the project site. This results in a shortage in the allowance necessary to cover the price for a soundwall.

For the above reasons, noise abatement measures are not recommended for this project.

While Caltrans recognizes an increase of 12 dBA as a substantial noise increase, Section 5.6 of Caltrans Noise Abatement Protocol (CATNAP) only allows consideration of extraordinary abatement measures (insulation of a public or private residence) on a case by case basis when a project causes an increase of 30 dBA, or when after-project noise levels are 75 dBA or higher.

At this time, no further noise analysis is needed. If you have questions or comments, please contact Allam Alhabaly, Trans. Engineer, at (559) 243-8227.

References

Technical Noise Supplement (TENS), 1998.

Traffic Noise Analysis Protocol, August 2006.

Highway Design Manual, 5th Edition Chapter 1100.

FHWA, 1977. Highway Construction Noise: Measurement, Prediction and Mitigation by J.A. Reagan and C.A. Grant, May 2.

FHWA, 1982a. Federal Aided Program Manual, Volume 7, Right Of Way and Environment; Chapter 7, Environment; Section 3, Procedures for Abatement of Highway Traffic Noise and Construction Noise (FHPM 7-7-3).

FHWA, 2004. Noise Barrier Cost Reduction Procedure TNM 2.5.

Glossary

Benefited residence – A dwelling unit expected to receive a noise reduction of at least 5 dBA from the proposed noise abatement measure. A multi-story residence counts as one benefited residence even if the proposed noise abatement provides 5 dBA for the exterior (e.g., balconies) of two or more floors. The definition is primarily used in the determination of noise abatement reasonableness.

CATNAP Caltrans Noise Abatement Protocol

dBA, dB(A) – Unit of sound pressure level in decibels on the “A-weighted” scale.

Existing noise level(s) – The noise, resulting from the natural and mechanical sources and human activity, considered normally present in a particular area.

FHWA Type I Project – A proposed federal or federal-aid highway project for the construction of a highway on a new location, or the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes. Caltrans extends this Type I definition to state highway projects without federal funding.

Insertion Loss (IL) – The actual noise level reduction at a specific receptor due to construction of a noise barrier between the noise source (traffic) and the receptor. Generally, it is the net effect of the (noise) barrier’s attenuation and the loss of ground effects.

Affected receptors – Receptors that will receive a traffic noise impact.

Leq – The equivalent steady state sound level that in a stated period of time would contain the same acoustical energy as the time-varying sound level during the same period.

Leq (h) – The energy-average of the A-weighted sound levels occurring during a one-hour period, in decibels (i.e., a one hour Leq (see Leq)).

Noise Abatement – Noise attenuation provided for non-significant adverse environmental effects due to noise.

Noise Mitigation – Noise attenuation provided for significant adverse environmental effects due to noise.

Predicted noise level(s) – Future noise levels, resulting from the natural and mechanical sources and human activity, considered being usually present in a particular area, including the project.

Receptors – Locations selected for determining traffic noise impacts. These locations should represent areas where frequent human use occurs or is likely to occur in the foreseeable future (e.g., vacant property for which development plans have received final approval).

Traffic Noise Impact – Impact that occurs at a receptor when one or both of the following takes place: 1) The predicted noise level substantially exceeds the existing noise level. 2) The predicted noise level associated with the project approaches or exceeds the Noise Abatement Criteria (NAC).

Traffic Mix – Light (L): vehicles having two axles and four wheels; Medium (M): vehicles having two axles and six wheels; Heavy (H): vehicles having three or more axles.

Units of Measurement – Kilometers per hour (km/h), miles per hour (mp/h), meters per second (mps), minutes (min), degrees Celsius (° C), and meters (m).

ATTACHMENT A

FIGURES 1 AND 2

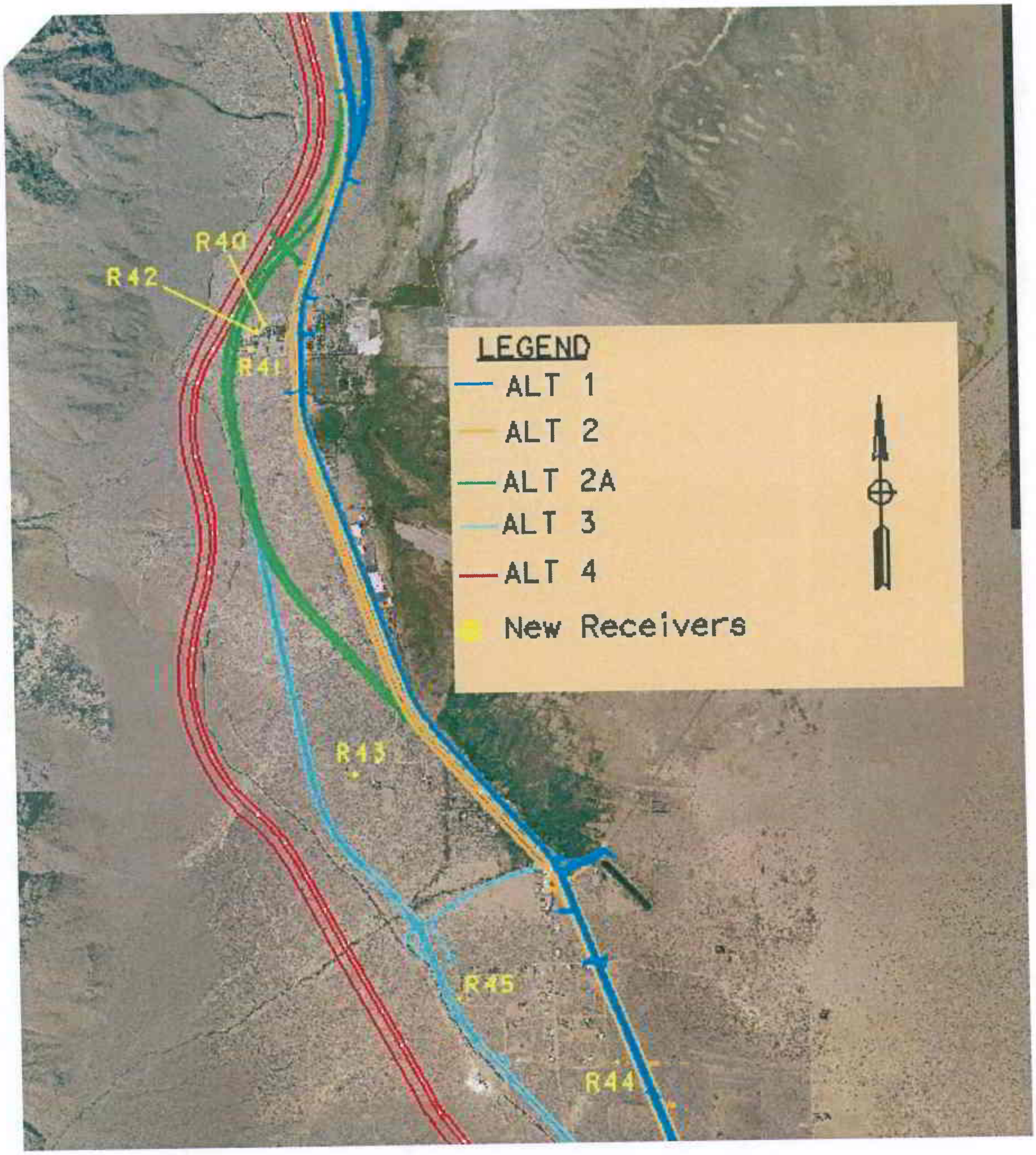


Figure 1. Olancha Cartago alternatives and recent receivers

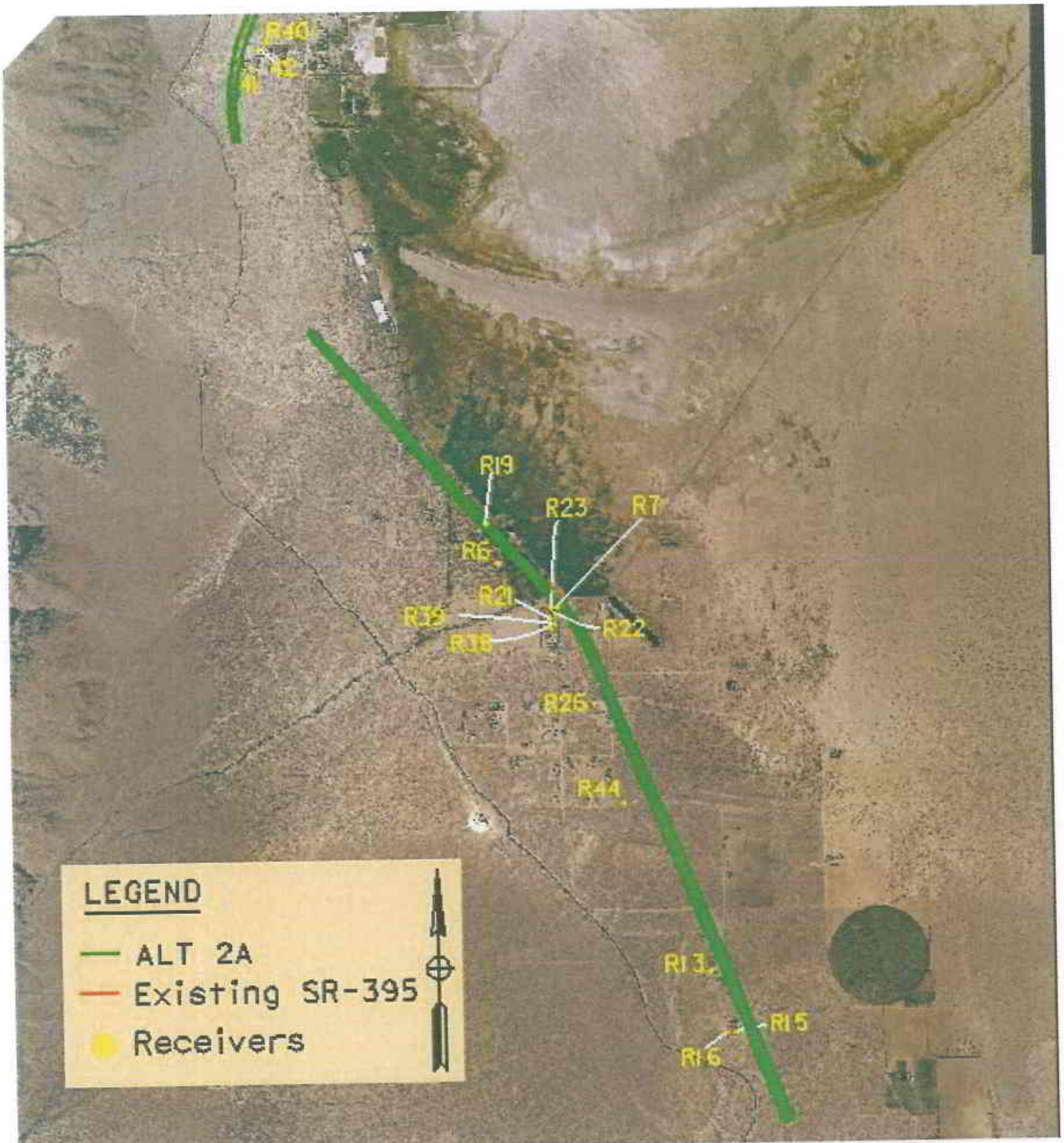


Figure 2. Receivers close to Alternative 2A alignment

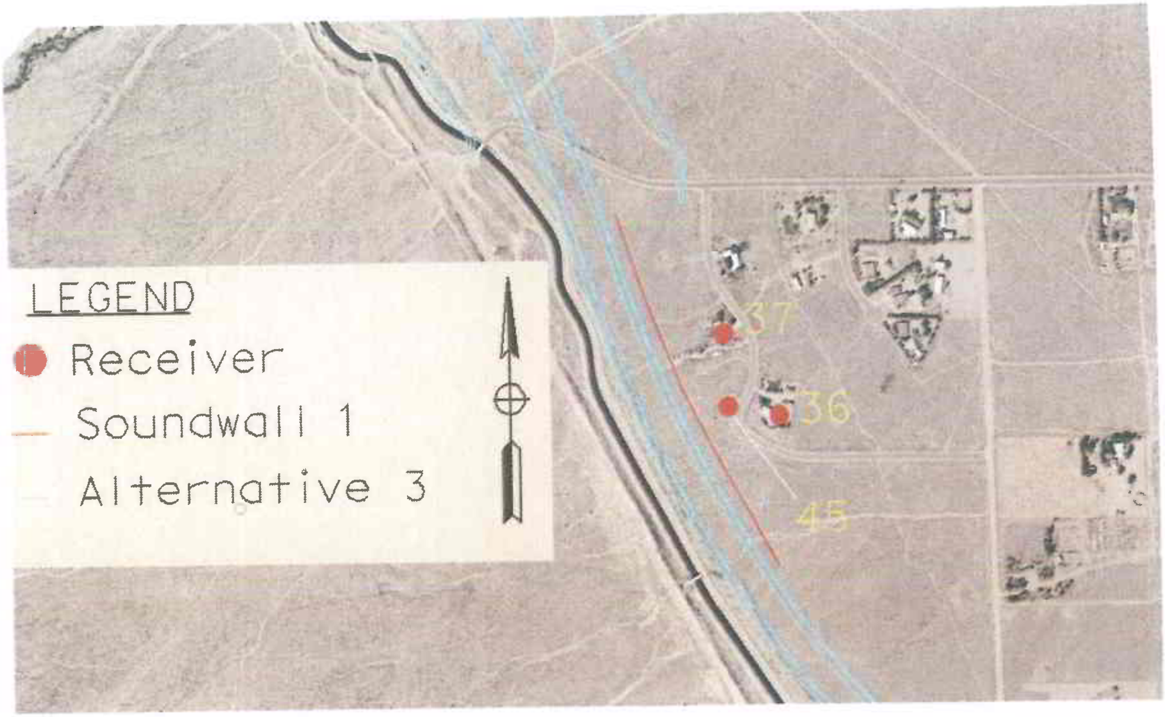


Figure 3. Barrier 3C location

ATTACHMENT B

REASONABLE ALLOWANCE WORKSHEETS

WORKSHEET "B1" FOR CALCULATING REASONABLE ALLOWANCE PER RESIDENCE				
Project ID		**PROJECT LOCATION:**	**Page:**	
Co. Rte.PM.		Olanch Project		
EA:		09-213400	**Date:**	4/26/2010
NOISE BARRIER I.D. & LOCATION: Barrier 3C (R-36)				
PROJECT ENGINEER: Ron Chegwidden				
Base allowance				**$31,000**
1) Absolute noise levels (Choose one)			**Check (x)**	
69 dBA or less:		Add $2,000		$2,000
70-74 dBA:		Add $4,000		
75-78 dBA:		Add $6,000		
More than 78 dBA:		Add $8,000		
2) "Build" vs Existing noise levels (Choose one)			**Check (x)**	
Less than 3 dBA		Add $0		
4-7 dBA		Add $2,000		
8-11 dBA		Add $4,000		
12 dBA or more		Add $6,000		$6,000
3) Achievable noise reduction (Choose one)			**Check (x)**	
Less than 6 dBA:		Add $0		$0
6-9 dBA:		Add $2,000		
9-11 dBA:		Add $4,000		
12 dBA or more:		Add $6,000		
4) Either new construction or pre-date 1978?			**Check (x)**	
(Choose yes or no)				
YES on either		Add $10,000		$10,000
NO on both		Add $0		
Unmodified Reasonable allowance per residence				**$49,000**

WORKSHEET "B2" FOR CALCULATING REASONABLE ALLOWANCE PER RESIDENCE

Project ID		**PROJECT LOCATION:**	**Page:**	
Co. Rte.PM.		Olanch Project		
EA:		09-213400	**Date:**	4/26/2010
NOISE BARRIER I.D. & LOCATION: Barrier 3C (R-37)				
PROJECT ENGINEER: Ron Chegwidden				
Base allowance				**$31,000**
1) Absolute noise levels (Choose one)			**Check (x)**	
69 dBA or less:		Add $2,000		$2,000
70-74 dBA:		Add $4,000		
75-78 dBA:		Add $6,000		
More than 78 dBA:		Add $8,000		
2) "Build" vs Existing noise levels (Choose one)			**Check (x)**	
Less than 3 dBA		Add $0		
4-7 dBA		Add $2,000		
8-11 dBA		Add $4,000		
12 dBA or more		Add $6,000		$6,000
3) Achievable noise reduction (Choose one)			**Check (x)**	
Less than 6 dBA:		Add $0		
6-9 dBA:		Add $2,000		$2,000
9-11 dBA:		Add $4,000		
12 dBA or more:		Add $6,000		
4) Either new construction or pre-date 1978?			**Check (x)**	
(Choose yes or no)				
YES on either		Add $10,000		$10,000
NO on both		Add $0		
Unmodified Reasonable allowance per residence				**$51,000**

WORKSHEET "B3" FOR CALCULATING REASONABLE ALLOWANCE PER RESIDENCE

Project ID		PROJECT LOCATION:	Page:	
Co. Rte.PM.		Olanch Project		
EA:		09-213400	Date:	4/26/2010
NOISE BARRIER I.D. & LOCATION: Barrier 3C (641 School Rd.)				
PROJECT ENGINEER: Ron Chegwidden				
Base allowance				$31,000
1) Absolute noise levels (Choose one)			Check (x)	
69 dBA or less:		Add $2,000		$2,000
70-74 dBA:		Add $4,000		
75-78 dBA:		Add $6,000		
More than 78 dBA:		Add $8,000		
2) "Build" vs Existing noise levels (Choose one)			Check (x)	
Less than 3 dBA		Add $0		
4-7 dBA		Add $2,000		
8-11 dBA		Add $4,000		
12 dBA or more		Add $6,000		$6,000
3) Achievable noise reduction (Choose one)			Check (x)	
Less than 6 dBA:		Add $0		
6-9 dBA:		Add $2,000		
9-11 dBA:		Add $4,000		$4,000
12 dBA or more:		Add $6,000		
4) Either new construction or pre-date 1978?			Check (x)	
(Choose yes or no)				
YES on either		Add $10,000		$10,000
NO on both		Add $0		
Unmodified Reasonable allowance per residence				$53,000

ATTACHMENT C

TRAFFIC DATA AND CALCULATIONS SHEETS

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: **LEE SCOTESE**
Design J

Date: May 30, 2008

File: 09-21340K
INY-395-PM 29.2/41.80
Olancha Cartago 4 Lane

From: **DONNA HOLLAND**
Traffic Operations

Subject: Traffic Index (TI) Calculations and Design Designation

Attached you will find the Traffic Index (TI) Calculations and Design Designation for the Olancha Cartago 4 Lane project on US 395 between PM's 29.20 and 41.80. This report updates any previous report you have received. Please include the DHV below as your Design Designation on your plan sheets.

Data Year.......................................2006 AADT = 6400 — DHV = 1055 (Existing)
Construction Year AADT..................2014 AADT = 6930
5 Year AADT...................................2019 AADT = 7280
10 Year AADT.................................2024 AADT = 7660
20 Year AADT.................................2034 AADT = 8460
5 Year TI..2019 TI = 10.0
10 Year TI..2024 TI = 11.0
20 Year TI..2034 TI = 12.0
Construction Year DHV.....................2014 DHV = 1140
5 Year DHV.....................................2019 DHV = 1200
10 Year DHV...................................2024 DHV = 1260
20 Year DHV...................................2034 DHV = 1390
2006 Directional Split = 76.77 %
2006 Trucks = 21.5 %

If you have any questions, please do not hesitate to call me. I may be reached at (760) 872-0711 or CALNET 8-627-0711.

Attachment

c: File

TRAFFIC INDEX and DESIGN DESIGNATION CALCULATION SHEET

CO-RTE-PM INY-395-PM 29.2/41.80
EA 09-21340K
JOB NAME Olancha Cartago 4 Lane

Requested by: Lee Scotese
Unit: Design J
Date: 05/30/08

Census Year 2006
Construction Year 2014
Complete Construction Year 2015
2 Way AADT 6,400
Lane Distribution Factor 1.0 (Table 602.3B, Highway Design Manual)

	AM Peak	PM Peak
Peak Hour Percent, K	14.92	16.48
Directional Split, D	65.22	76.77
Product of K and D, KD	9.73	12.65
DHV = AADT x K /100	955	1055

PERCENT TRUCKS (%) 21.5
1 WAY TRUCK VOLUME 1056
GROWTH FACTOR, %/Year 1.0

--------------------TRAFFIC INDEX CALCULATIONS--------------------

Traffic Index Calculations are based on completion of construction per HDM 103.2

FIVE YEAR TRAFFIC INDEX

Vehicle Type	Trucks (%)	Present ADT One Way	Expansion Factor	Expanded ADT One Way	5 Year Constant	Lane Factor	ESALs
2 axle	30.65	324.0	1.1212	363.0	345	1	125,235
3 axle	9.44	100.0	1.1212	112.0	920	1	103,040
4 axle	7.77	82.0	1.1212	92.0	1470	1	135,240
5 axle	52.14	551.0	1.1212	618.0	3445	1	2,129,010
TOTALS	100	1057.0		1185.0			2,492,525

Five Year TI 10.0

TEN YEAR TRAFFIC INDEX

Vehicle Type	Trucks (%)	Present ADT One Way	Expansion Factor	Expanded ADT One Way	10 Year Constant	Lane Factor	ESALs
2 axle	30.65	324.0	1.1495	372.0	690	1	256,680
3 axle	9.44	100.0	1.1495	115.0	1840	1	211,600
4 axle	7.77	82.0	1.1495	94.0	2940	1	276,360
5 axle	52.14	551.0	1.1495	633.0	6890	1	4,361,370
TOTALS	100	1057.0		1214.0			5,106,010

Ten Year TI 11.0

TWENTY YEAR TRAFFIC INDEX

Vehicle Type	Trucks (%)	Present ADT One Way	Expansion Factor	Expanded ADT One Way	20 Year Constant	Lane Factor	ESALs
2 axle	30.65	324.0	1.2081	391.0	1380	1	539,580
3 axle	9.44	100.0	1.2081	121.0	3680	1	445,280
4 axle	7.77	82.0	1.2081	99.0	5880	1	582,120
5 axle	52.14	551.0	1.2081	666.0	13780	1	9,177,480
TOTALS	100	1057.0		1277.0			10,744,460

Twenty Yr TI 12.0

SHOULDER TIs

Design Life	2% ESALs	TI
5 Year	49,851	6.5
10 Year	102,120	7.0
20 Year	214,889	7.5

--------------------DESIGN DESIGNATION--------------------

Design Designation is based on year of construction per HDM 103.1

Construction Year AADT.. AADT (2014) = 6930
Five Year AADT.. AADT (2019) = 7280
Ten Year AADT.. AADT (2024) = 7660
Twenty Year AADT.. AADT (2034) = 8460
Construction Year DHV.. DHV (2014) = 1140
Five Year DHV.. DHV (2019) = 1200
Ten Year DHV.. DHV (2024) = 1260
Twenty Year DHV.. DHV (2034) = 1390
D = 76.77 %
T = 21.5 %

TRAFFIC OPERATIONS

May 30, 2008
DATE

Existing traffic for 2006

- Based on based on truck percentage of 21.5%

DHV for 2006 = 1055

Directional split:

DHV for Eastbound = 76.77% of total DHV -- from traffic sheet

= 0.7677 * = $\boxed{810}$

(MT) Medium trucks = 0.3065 * 0.215 * 810 = $\boxed{53}$ (MT comprise 30.65%)

(HT) Heavy trucks = 0.6935 * 0.215 * 810 = $\boxed{121}$ (HT comprise 69.35%)

Auto's = 810 - (53+121) = $\boxed{636}$

DHV for Westbound = 23.23% of total DHV for 2006

= 0.2323 * 1055 = $\boxed{245}$

(MT) Medium trucks = 0.3065 * 0.215 * 245 = $\boxed{16}$ (MT comprise 30.65%)

(HT) Heavy trucks = 0.6935 * 0.215 * 245 = $\boxed{37}$ (HT comprise 69.35%)

Autos = 245 - (16 + 37) = $\boxed{192}$

Future traffic for the year 2034 : 20 years after [illegible]

DHV for 2034 = 1390

DHV for Eastbound = 76.77% of total DHV .. from traffic sheet

= 0.7677 * 1390 = $\boxed{1067}$

Medium trucks = 0.3065 * 0.215 * 1067 = $\boxed{70}$

Heavy trucks = 0.6935 * 0.215 * 1067 = $\boxed{159}$

Autos = 1067 − (70 + 159) = $\boxed{838}$

DHV for Westbound . 23.23 % of total DHV .

= 0.2323 * 1390 = $\boxed{323}$

Medium trucks = 0.3065 * 0.215 * 323 = $\boxed{21}$

Heavy trucks = 0.6935 * 0.215 * 323 = $\boxed{48}$

Autos = 323 − (21 + 48) = $\boxed{254}$

TRAFFIC DATA DATA _2003 NOISE STUDY

State of California
DEPARTMENT OF TRANSPORTATION

Business Transportation and Housing Agency

Memorandum

To: KURT WEIERMANN
Project Development

Date: February 27, 2007

File: 09-21340K
INY-395-PM 30.8/41.8

From: DONNA HOLLAND
Traffic Operations

Subject: Traffic Index (TI) Calculations and Design Designation

Attached you will find the Traffic Index (TI) Calculations and Design Designation for the above referenced project between PM's 30.8 to 41.8.

Data Year.......................................2005 AADT = 6300
Construction Year AADT...................2012 AADT = 6750
5 Year AADT....................................2017 AADT = 7100
10 Year AADT..................................2022 AADT = 7460
20 Year AADT..................................2032 AADT = 8240
5 Year TI...2017 TI = 9.5
10 Year TI.......................................2022 TI = 10.0
20 Year TI.......................................2032 TI = 11.0
Construction Year DDHV..................2012 DDHV = 830
5 Year DDHV...................................2017 DDHV = 870
10 Year DDHV.................................2022 DDHV = 920
20 Year DDHV.................................2032 DDHV = 1010
2005 Directional Split = 72.37 %
2005 Trucks = 8.7 %

If you have any questions, please do not hesitate to call me. I may be reached at (760) 872-0711 or CALNET 8-627-0711.

Attachment

c: File

TRAFFIC INDEX and DESIGN DESIGNATION
CALCULATION SHEET

CO-RTE-PM INY-395-PM 30.8/41.8
EA 09-21340K
JOB NAME Olancha/Cartago 4 Lane

Requested by: Kurt Weiermann
Unit: Project Development
Date: 02/27/07

Census Year 2005
Construction Year 2012
Complete Construction Year 2014
2 Way AADT 6,300
Lane Distribution Factor 1.0 (Table 602.3B, Highway Design Manual)

	AM Peak	PM Peak
Peak Hour Percent, K	14.07	17
Directional Split, D	69.69	72.37
Product of K and D, KD	9.81	12.30
DHV = AADT x K x D	618	775

PERCENT TRUCKS (%) 8.7
1 WAY TRUCK VOLUME 397
GROWTH FACTOR, %/Year 1.0

--------------------TRAFFIC INDEX CALCULATIONS--------------------

Traffic Index Calculations are based on completion of construction per HDM 103.2

FIVE YEAR TRAFFIC INDEX

Vehicle Type	Trucks (%)	Present ADT One Way	Expansion Factor	Expanded ADT One Way	5 Year Constant	Lane Factor	ESALs
2 axle	9.3	37.0	1.1212	41.0	345	1	14,145
3 axle	3	12.0	1.1212	13.0	920	1	11,960
4 axle	1.1	4.0	1.1212	4.0	1470	1	5,880
5 axle	86.6	344.0	1.1212	386.0	3445	1	1,329,770
TOTALS	100	397.0		444.0			1,361,755

Five Year TI **9.5**

TEN YEAR TRAFFIC INDEX

Vehicle Type	Trucks (%)	Present ADT One Way	Expansion Factor	Expanded ADT One Way	10 Year Constant	Lane Factor	ESALs
2 axle	9.3	37.0	1.1495	43.0	690	1	29,670
3 axle	3	12.0	1.1495	14.0	1840	1	25,760
4 axle	1.1	4.0	1.1495	5.0	2940	1	14,700
5 axle	86.6	344.0	1.1495	395.0	6890	1	2,721,550
TOTALS	100	397.0		457.0			2,791,680

Ten Year TI **10.0**

TWENTY YEAR TRAFFIC INDEX

Vehicle Type	Trucks (%)	Present ADT One Way	Expansion Factor	Expanded ADT One Way	20 Year Constant	Lane Factor	ESALs
2 axle	9.3	37.0	1.2081	45.0	1380	1	62,100
3 axle	3	12.0	1.2081	14.0	3680	1	51,520
4 axle	1.1	4.0	1.2081	5.0	5880	1	29,400
5 axle	86.6	344.0	1.2081	416.0	13780	1	5,732,480
TOTALS	100	397.0		480.0			5,875,500

Twenty Yr TI **11.0**

SHOULDER TIs

Design Life	2% ESALs	TI
5 Year	27,235	**6.0**
10 Year	55,834	**6.5**
20 Year	117,510	**7.0**

--------------------DESIGN DESIGNATION--------------------

Design Designation is based on year of construction per HDM 103.1

Construction Year AADT.. **AADT (2012) = 6750**
Five Year AADT.. **AADT (2017) = 7100**
Ten Year AADT.. **AADT (2022) = 7460**
Twenty Year AADT.. **AADT (2032) = 8240**
Construction Year DDHV.. **DDHV (2012) = 830**
Five Year DDHV.. **DDHV (2017) = 870**
Ten Year DDHV.. **DDHV (2022) = 920**
Twenty Year DDHV.. **DDHV (2032) = 1010**
D = 72.37 %
T = 8.7 %

TRAFFIC OPERATIONS

February 27, 2007
DATE

ATTACHMENT D

MODEL TNM 2.5 OUTPUT TABLES

RESULTS: SOUND LEVELS

09-213400

Caltrans
Allam Alhabaly

30 April 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 09-213400
RUN: Olancha noise study-Alt 1
BARRIER DESIGN: INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS: 68 deg F, 50% RH

Receiver				No Barrier						With Barrier			
Name	No.	#DUs	Existing LAeq1h	LAeq1h		Increase over existing		Type Impact		Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc				Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB			dBA	dB	dB	dB
R1: 299 s Pine SFR	28	1	0.0	58.9	66	58.9	12	----		58.9	0.0	5	-5.0
R2: Behive Hut in front of R1 Commercial	29	1	0.0	55.0	66	55.0	12	----		55.0	0.0	5	-5.0
R3: Sierra and Whitney St SFR	30	1	0.0	58.9	66	58.9	12	----		58.9	0.0	5	-5.0
R4: 497 Lacey Lane SFR	31	1	0.0	41.0	66	41.0	12	----		41.0	0.0	5	-5.0
R5: 301 Olanch Lane SFR	33	1	0.0	50.6	66	50.6	12	----		50.6	0.0	5	-5.0
R-6: 100 Olancha Lane SFR	35	1	0.0	54.3	66	54.3	12	----		54.3	0.0	5	-5.0
R7: Printing business	36	1	0.0	64.0	66	64.0	12	----		64.0	0.0	5	-5.0
R8: Olanch School	37	1	0.0	53.5	66	53.5	12	----		53.5	0.0	5	-5.0
R9: Fall St/Summer ST Intchange SFR	38	1	0.0	41.1	66	41.1	12	----		41.1	0.0	5	-5.0
R10: Near fall St./Summer Rd. SFR	40	1	0.0	41.9	66	41.9	12	----		41.9	0.0	5	-5.0
R11: Near Existing SR-395 SFR	42	1	0.0	46.0	66	46.0	12	----		46.0	0.0	5	-5.0
R12: Deepest home off of Williams Rd. SFR	43	1	0.0	41.9	66	41.9	12	----		41.9	0.0	5	-5.0
R13: Ranch Motel	44	1	0.0	64.3	66	64.3	12	----		64.3	0.0	5	-5.0
R14: Ranch Motel	46	1	0.0	58.3	66	58.3	12	----		58.3	0.0	5	-5.0
R15: Rv Park front	48	1	0.0	64.8	66	64.8	12	----		64.8	0.0	5	-5.0
R16: Rv Park back	49	1	0.0	57.5	66	57.5	12	----		57.5	0.0	5	-5.0
R17: Represented by R3	50	1	0.0	61.3	66	61.3	12	----		61.3	0.0	5	-5.0
R18: Represented by R4	51	1	0.0	47.1	66	47.1	12	----		47.1	0.0	5	-5.0
R19: Represented by R6	52	1	0.0	62.9	66	62.9	12	----		62.9	0.0	5	-5.0
R-20: Represented by R4	53	1	0.0	40.6	66	40.6	12	----		40.6	0.0	5	-5.0
R21: Historic school House	54	1	0.0	57.2	66	57.2	12	----		57.2	0.0	5	-5.0
R-22: Represented by R7	55	1	0.0	61.0	66	61.0	12	----		61.0	0.0	5	-5.0
R-23: Represented by R7	56	1	0.0	60.7	66	60.7	12	----		60.7	0.0	5	-5.0
R24: Represented by R7	57	1	0.0	54.5	66	54.5	12	----		54.5	0.0	5	-5.0

RESULTS: SOUND LEVELS

R25: Represented by R7	58	1	0.0	51.8	66	51.8	12	----	51.8	0.0	5	-5.0
R-26: Represented by R7	59	1	0.0	62.3	66	62.3	12	----	62.3	0.0	5	-5.0
R27: Represented by R12	60	1	0.0	52.3	66	52.3	12	----	52.3	0.0	5	-5.0
R28: Represented by R12	61	1	0.0	46.0	66	46.0	12	----	46.0	0.0	5	-5.0
R29: Represented by R12	62	1	0.0	45.0	66	45.0	12	----	45.0	0.0	5	-5.0
R30: Represented by R12	63	1	0.0	53.6	66	53.6	12	----	53.6	0.0	5	-5.0
R31: Represented by R12	64	1	0.0	50.9	66	50.9	12	----	50.9	0.0	5	-5.0
R32: Represented by R12	65	1	0.0	44.6	66	44.6	12	----	44.6	0.0	5	-5.0
R33: Represented by R12	66	1	0.0	43.8	66	43.8	12	----	43.8	0.0	5	-5.0
R34: Represented by R12	67	1	0.0	48.0	66	48.0	12	----	48.0	0.0	5	-5.0
R35: Represented by R12	68	1	0.0	42.1	66	42.1	12	----	42.1	0.0	5	-5.0
R36: Represented by R9	69	1	0.0	40.9	66	40.9	12	----	40.9	0.0	5	-5.0
R37: represented by R9	70	1	0.0	40.8	66	40.8	12	----	40.8	0.0	5	-5.0
R38: Represented by R9	71	1	0.0	55.2	66	55.2	12	----	55.2	0.0	5	-5.0
R39: Represented by R7	72	1	0.0	59.0	66	59.0	12	----	59.0	0.0	5	-5.0
R40: 295 West Lake St. first SFR	74	1	0.0	50.6	66	50.6	12	----	50.6	0.0	5	-5.0
R41: 295 West Lake St. second SFR	75	1	0.0	48.9	66	48.9	12	----	48.9	0.0	5	-5.0
R42: 300 West Lake St. SFR	76	1	0.0	48.1	66	48.1	12	----	48.1	0.0	5	-5.0
R43: 45 Shop St. first SFR	77	1	0.0	61.6	66	61.6	12	----	61.6	0.0	5	-5.0
R44: 695 HWY 395 SFR	79	1	0.0	55.3	66	55.3	12	----	55.3	0.0	5	-5.0
R45: 641 School Rd. SFR	81	1	0.0	40.6	66	40.6	12	----	40.6	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	45	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Caltrans
Allam Alhabaly

30 April 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 09-213400
RUN: Olancha noise study-Alt 2
BARRIER DESIGN: INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS: 68 deg F, 50% RH

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1: 299 s Pine SFR	28	1	0.0	62.1	66	62.1	12	----	62.1	0.0	5	-5.0
R2: Behive Hut in front of R1 Commercial	37	1	0.0	57.2	66	57.2	12	----	57.2	0.0	5	-5.0
R3: Sierra and Whitney St SFR	40	1	0.0	55.8	66	55.8	12	----	55.8	0.0	5	-5.0
R4: 497 Lacey Lane SFR	42	1	0.0	48.4	66	48.4	12	----	48.4	0.0	5	-5.0
R5: 301 Olanch Lane SFR	45	1	0.0	52.7	66	52.7	12	----	52.7	0.0	5	-5.0
R-6: 100 Olancha Lane SFR	47	1	0.0	59.3	66	59.3	12	----	59.3	0.0	5	-5.0
R7: Printing business	48	1	0.0	67.7	66	67.7	12	Snd Lvl	67.7	0.0	5	-5.0
R8: Olanch School	50	1	0.0	52.6	66	52.6	12	----	52.6	0.0	5	-5.0
R9: Fall St/Summer ST Intchange SFR	51	1	0.0	41.5	66	41.5	12	----	41.5	0.0	5	-5.0
R10: Near fall St./Summer Rd. SFR	52	1	0.0	42.2	66	42.2	12	----	42.2	0.0	5	-5.0
R11: Near Existing SR-395 SFR	53	1	0.0	45.6	66	45.6	12	----	45.6	0.0	5	-5.0
R12: Deepest home off of Williams Rd. SFF	56	1	0.0	41.8	66	41.8	12	----	41.8	0.0	5	-5.0
R13: Ranch Motel	57	1	0.0	60.4	66	60.4	12	----	60.4	0.0	5	-5.0
R14: Ranch Motel	58	1	0.0	55.9	66	55.9	12	----	55.9	0.0	5	-5.0
R15: Rv Park front	59	1	0.0	60.8	66	60.8	12	----	60.8	0.0	5	-5.0
R16: Rv Park back	60	1	0.0	55.3	66	55.3	12	----	55.3	0.0	5	-5.0
R17: Represented by R3	61	1	0.0	57.4	66	57.4	12	----	57.4	0.0	5	-5.0
R18: Represented by R4	64	1	0.0	50.8	66	50.8	12	----	50.8	0.0	5	-5.0
R19: Represented by R6	65	1	0.0	67.2	66	67.2	12	Snd Lvl	67.2	0.0	5	-5.0
R-20: Represented by R4	66	1	0.0	44.4	66	44.4	12	----	44.4	0.0	5	-5.0
R21: Historic school House	68	1	0.0	59.6	66	59.6	12	----	59.6	0.0	5	-5.0
R-22: Represented by R7	69	1	0.0	62.7	66	62.7	12	----	62.7	0.0	5	-5.0
R-23: Represented by R7	70	1	0.0	62.7	66	62.7	12	----	62.7	0.0	5	-5.0
R24: Represented by R7	71	1	0.0	53.4	66	53.4	12	----	53.4	0.0	5	-5.0

RESULTS: SOUND LEVELS

R25: Represented by R7	72	1	0.0	51.5	66	51.5	12	----	51.5	0.0	5	-5.0
R-26: Represented by R7	73	1	0.0	59.2	66	59.2	12	----	59.2	0.0	5	-5.0
R27: Represented by R12	74	1	0.0	50.9	66	50.9	12	----	50.9	0.0	5	-5.0
R28: Represented by R12	75	1	0.0	45.6	66	45.6	12	----	45.6	0.0	5	-5.0
R29: Represented by R12	76	1	0.0	44.7	66	44.7	12	----	44.7	0.0	5	-5.0
R30: Represented by R12	77	1	0.0	52.0	66	52.0	12	----	52.0	0.0	5	-5.0
R31: Represented by R12	78	1	0.0	49.7	66	49.7	12	----	49.7	0.0	5	-5.0
R32: Represented by R12	79	1	0.0	44.4	66	44.4	12	----	44.4	0.0	5	-5.0
R33: Represented by R12	80	1	0.0	43.6	66	43.6	12	----	43.6	0.0	5	-5.0
R34: Represented by R12	81	1	0.0	47.3	66	47.3	12	----	47.3	0.0	5	-5.0
R35: Represented by R12	82	1	0.0	42.3	66	42.3	12	----	42.3	0.0	5	-5.0
R36: Represented by R9	83	1	0.0	41.1	66	41.1	12	----	41.1	0.0	5	-5.0
R37: represented by R9	84	1	0.0	41.1	66	41.1	12	----	41.1	0.0	5	-5.0
R38: Represented by R9	85	1	0.0	55.5	66	55.5	12	----	55.5	0.0	5	-5.0
R39: Represented by R7	86	1	0.0	59.3	66	59.3	12	----	59.3	0.0	5	-5.0
R40: 295 West Lake St. first SFR	87	1	0.0	52.1	66	52.1	12	----	52.1	0.0	5	-5.0
R41: 295 West Lake St. second SFR	88	1	0.0	50.7	66	50.7	12	----	50.7	0.0	5	-5.0
R42: 300 West Lake St. SFR	91	1	0.0	49.1	66	49.1	12	----	49.1	0.0	5	-5.0
R43: 45 Shop St. first SFR	93	1	0.0	63.2	66	63.2	12	----	63.2	0.0	5	-5.0
R44: 695 HWY 395 SFR	94	1	0.0	53.4	66	53.4	12	----	53.4	0.0	5	-5.0
R45: 641 School Rd. SFR	99	1	0.0	40.8	66	40.8	12	----	40.8	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	45	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

RESULTS: SOUND LEVELS

09-213400

Caltrans
Allam Alhabaly

30 April 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 09-213400
RUN: Olancha noise study-Alt 3
BARRIER DESIGN: INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS: 68 deg F, 50% RH

Receiver				No Barrier						With Barrier			
Name	No.	#DUs	Existing LAeq1h	LAeq1h		Increase over existing		Type Impact		Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc				Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB			dBA	dB	dB	dB
R1: 299 s Pine SFR	28	1	0.0	61.6	66	61.6	12	----		61.6	0.0	5	-5.0
R2: Behive Hut in front of R1 Commercial	30	1	0.0	58.2	66	58.2	12	----		58.2	0.0	5	-5.0
R3: Sierra and Whitney St SFR	31	1	0.0	55.0	66	55.0	12	----		55.0	0.0	5	-5.0
R4: 497 Lacey Lane SFR	33	1	0.0	40.2	66	40.2	12	----		40.2	0.0	5	-5.0
R5: 301 Olanch Lane SFR	36	1	0.0	42.6	66	42.6	12	----		42.6	0.0	5	-5.0
R-6: 100 Olancha Lane SFR	38	1	0.0	41.2	66	41.2	12	----		41.2	0.0	5	-5.0
R7: Printing business	39	1	0.0	40.8	66	40.8	12	----		40.8	0.0	5	-5.0
R8: Olanch School	40	1	0.0	39.1	66	39.1	12	----		39.1	0.0	5	-5.0
R9: Fall St/Summer ST Intchange SFR	41	1	0.0	54.0	66	54.0	12	----		54.0	0.0	5	-5.0
R10: Near fall St./Summer Rd. SFR	42	1	0.0	48.8	66	48.8	12	----		48.8	0.0	5	-5.0
R11: Near Existing SR-395 SFR	43	1	0.0	41.7	66	41.7	12	----		41.7	0.0	5	-5.0
R12: Deepest home off of Williams Rd. SFI	44	1	0.0	57.3	66	57.3	12	----		57.3	0.0	5	-5.0
R13: Ranch Motel	45	1	0.0	33.0	66	33.0	12	----		33.0	0.0	5	-5.0
R14: Ranch Motel	46	1	0.0	33.2	66	33.2	12	----		33.2	0.0	5	-5.0
R15: Rv Park front	47	1	0.0	31.4	66	31.4	12	----		31.4	0.0	5	-5.0
R16: Rv Park back	48	1	0.0	31.5	66	31.5	12	----		31.5	0.0	5	-5.0
R17: Represented by R3	49	1	0.0	56.6	66	56.6	12	----		56.6	0.0	5	-5.0
R18: Represented by R4	51	1	0.0	36.8	66	36.8	12	----		36.8	0.0	5	-5.0
R19: Represented by R6	52	1	0.0	40.2	66	40.2	12	----		40.2	0.0	5	-5.0
R-20: Represented by R4	53	1	0.0	37.0	66	37.0	12	----		37.0	0.0	5	-5.0
R21: Historic school House	54	1	0.0	41.6	66	41.6	12	----		41.6	0.0	5	-5.0
R-22: Represented by R7	55	1	0.0	41.2	66	41.2	12	----		41.2	0.0	5	-5.0
R-23: Represented by R7	56	1	0.0	41.2	66	41.2	12	----		41.2	0.0	5	-5.0
R24: Represented by R7	57	1	0.0	42.5	66	42.5	12	----		42.5	0.0	5	-5.0

RESULTS: SOUND LEVELS

R25: Represented by R7	58	1	0.0	43.2	66	43.2	12	----	43.2	0.0	5	-5.0
R-26: Represented by R7	59	1	0.0	38.7	66	38.7	12	----	38.7	0.0	5	-5.0
R27: Represented by R12	60	1	0.0	39.8	66	39.8	12	----	39.8	0.0	5	-5.0
R28: Represented by R12	61	1	0.0	42.2	66	42.2	12	----	42.2	0.0	5	-5.0
R29: Represented by R12	62	1	0.0	43.3	66	43.3	12	----	43.3	0.0	5	-5.0
R30: Represented by R12	63	1	0.0	39.8	66	39.8	12	----	39.8	0.0	5	-5.0
R31: Represented by R12	64	1	0.0	40.3	66	40.3	12	----	40.3	0.0	5	-5.0
R32: Represented by R12	65	1	0.0	44.3	66	44.3	12	----	44.3	0.0	5	-5.0
R33: Represented by R12	66	1	0.0	46.7	66	46.7	12	----	46.7	0.0	5	-5.0
R34: Represented by R12	67	1	0.0	41.8	66	41.8	12	----	41.8	0.0	5	-5.0
R35: Represented by R12	68	1	0.0	48.2	66	48.2	12	----	48.2	0.0	5	-5.0
R36: Represented by R9	69	1	0.0	56.2	66	56.2	12	----	56.2	0.0	5	-5.0
R37: represented by R9	70	1	0.0	57.7	66	57.7	12	----	57.7	0.0	5	-5.0
R38: Represented by R9	71	1	0.0	41.9	66	41.9	12	----	41.9	0.0	5	-5.0
R39: Represented by R7	72	1	0.0	41.5	66	41.5	12	----	41.5	0.0	5	-5.0
R40: 295 West Lake St. first SFR	73	1	0.0	53.2	66	53.2	12	----	53.2	0.0	5	-5.0
R41: 295 West Lake St. second SFR	74	1	0.0	52.1	66	52.1	12	----	52.1	0.0	5	-5.0
R42: 300 West Lake St. SFR	75	1	0.0	50.5	66	50.5	12	----	50.5	0.0	5	-5.0
R43: 45 Shop St. first SFR	76	1	0.0	41.2	66	41.2	12	----	41.2	0.0	5	-5.0
R44: 695 HWY 395 SFR	77	1	0.0	39.5	66	39.5	12	----	39.5	0.0	5	-5.0
R45: 641 School Rd. SFR	78	1	0.0	61.9	66	61.9	12	----	61.9	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	45	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Caltrans
Allam Alhabaly

30 April 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: BARRIER DESIGN
PROJECT/CONTRACT: 09-213400
RUN: Olancha noise study-Alt 3
BARRIER DESIGN: Barrier 3C

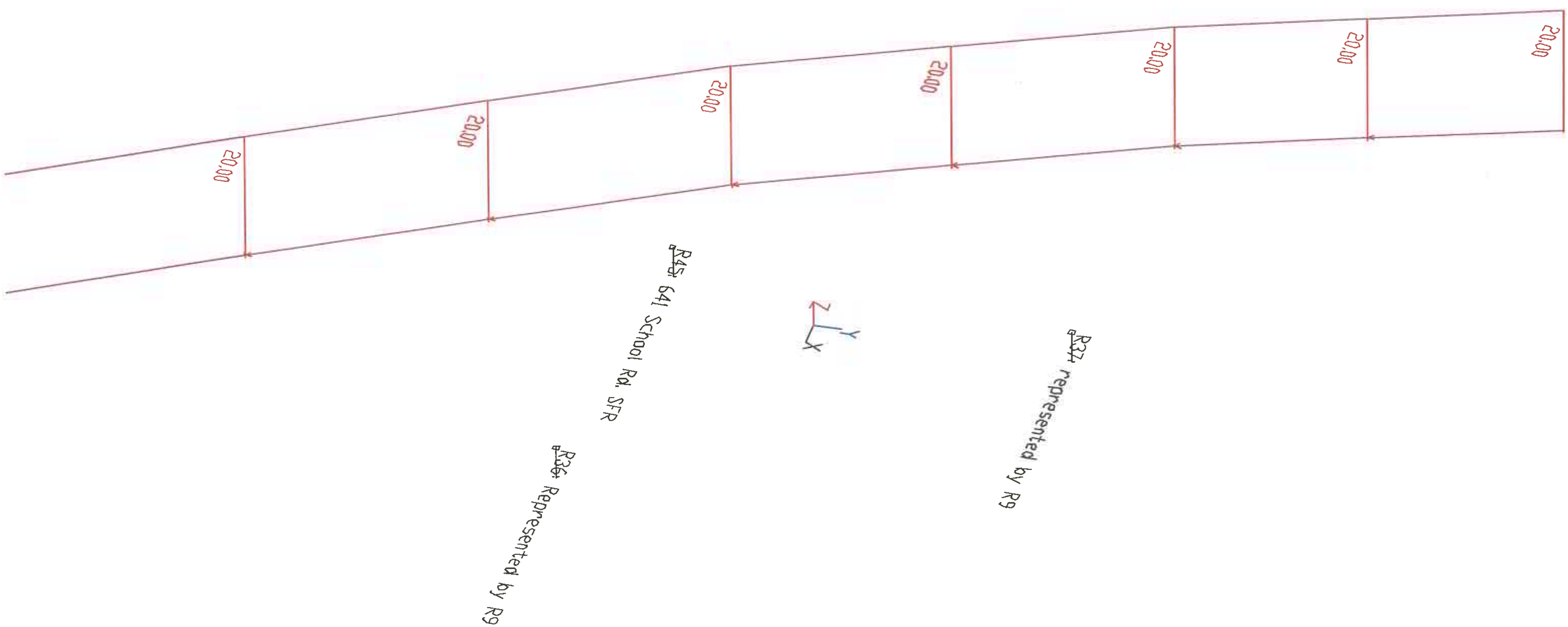
ATMOSPHERICS: 68 deg F, 50% RH

Selected Receivers

Name	No.	Calc LAeq1h	Noise Reduction Calc	Goal	Calc-Goal	Barrier Reviewed	Important Segments Name	No.	Height	Partial LAeq1h
		dBA	dB	dB	dB				ft	dBA
R45: 641 School Rd. SFR	78	53.6	8.7	5	3.7	Barrier6	point16	16	20.0	49.3
						Barrier6	point22	22	10.0	52.3
						Barrier6	point21	21	10.0	50.3
						Barrier6	point15	15	10.0	46.4
						Barrier6	point17	17	10.0	44.2
						Barrier6	point23	23	10.0	42.4
						Barrier6	point19	19	10.0	41.2
						Barrier6	point20	20	10.0	38.9
R36: Represented by R9	69	51.6	4.9	5	-0.1	Barrier6	point21	21	20.0	43.5
						Barrier6	point16	16	10.0	49.5
						Barrier6	point17	17	10.0	48.1
						Barrier6	point22	22	10.0	46.8
						Barrier6	point20	20	10.0	44.1
						Barrier6	point15	15	10.0	43.7
						Barrier6	point23	23	10.0	40.6
						Barrier6	point19	19	10.0	38.4
R37: represented by R9	70	52.7	5.3	5	0.3	Barrier6	point15	15	20.0	44.5
						Barrier6	point22	22	10.0	50.6
						Barrier6	point23	23	10.0	49.2
						Barrier6	point16	16	10.0	47.9
						Barrier6	point19	19	10.0	46.4

RESULTS: BARRIER DESIGN

						Barrier6	point21	21	10.0	43.7
						Barrier6	point17	17	10.0	40.4
						Barrier6	point20	20	10.0	36.8
Total Cost, All Barriers (including additional cost(s))					$1046160					



Olancha noise study-Alt 3	Sheet 1 of 1	30 Apr 2010
	Caltrans	
Barrier View-Barrier 3C	Project/Contract No. 09-213400	
Run name: Alt3_Barrier	TNM Version 2.5, Feb 2004	
Scale: <DNA - due to perspective>	Analysis By: Allam Alhabaly	

Roadway:	Ground Zone: polygon
Receiver:	Tree Zone: dashed polygon
Barrier:	Contour Zone: polygon
Building Row:	Parallel Barrier:
Terrain Line:	Skew Section:

RESULTS: SOUND LEVELS

Caltrans
Allam Alhabaly

30 April 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT:	09-213400
RUN:	Olancha noise study-Alt 2A
BARRIER DESIGN:	INPUT HEIGHTS
ATMOSPHERICS:	68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1: 299 s Pine SFR	1	1	27.4	48.8	66	21.4	12	Sub'l Inc	48.8	0.0	5	-5.0
R2: Behive Hut in front of R1 Commercial	3	1	27.4	50.9	66	23.5	12	Sub'l Inc	50.9	0.0	5	-5.0
R3: Sierra and Whitney St SFR	4	1	55.5	47.4	66	-8.1	12	----	47.4	0.0	5	-5.0
R4: 497 Lacey Lane SFR	5	1	58.0	48.4	66	-9.6	12	----	48.4	0.0	5	-5.0
R5: 301 Olanch Lane SFR	6	1	59.6	52.7	66	-6.9	12	----	52.7	0.0	5	-5.0
R-6: 100 Olancha Lane SFR	7	1	56.0	59.3	66	3.3	12	----	59.3	0.0	5	-5.0
R7: Printing business	8	1	53.2	67.7	66	14.5	12	Both	67.7	0.0	5	-5.0
R8: Olanch School	9	1	53.6	52.6	66	-1.0	12	----	52.6	0.0	5	-5.0
R9: Fall St/Summer ST Intchange SFR	17	1	51.9	41.5	66	-10.4	12	----	41.5	0.0	5	-5.0
R10: Near fall St./Summer Rd. SFR	18	1	60.6	42.2	66	-18.4	12	----	42.2	0.0	5	-5.0
R11: Near Existing SR-395 SFR	22	1	62.4	45.6	66	-16.8	12	----	45.6	0.0	5	-5.0
R12: Deepest home off of Williams Rd. SFF	24	1	53.5	41.8	66	-11.7	12	----	41.8	0.0	5	-5.0
R13: Ranch Motel	26	1	61.6	60.4	66	-1.2	12	----	60.4	0.0	5	-5.0
R14: Ranch Motel	28	1	0.0	55.9	66	55.9	12	----	55.9	0.0	5	-5.0
R15: Rv Park front	29	1	0.0	60.8	66	60.8	12	----	60.8	0.0	5	-5.0
R16: Rv Park back	30	1	0.0	55.3	66	55.3	12	----	55.3	0.0	5	-5.0
R17: Represented by R3	31	1	0.0	46.5	66	46.5	12	----	46.5	0.0	5	-5.0
R18: Represented by R4	33	1	0.0	50.8	66	50.8	12	----	50.8	0.0	5	-5.0
R19: Represented by R6	34	1	0.0	67.2	66	67.2	12	Snd Lvl	67.2	0.0	5	-5.0
R-20: Represented by R4	35	1	0.0	44.4	66	44.4	12	----	44.4	0.0	5	-5.0
R21: Historic school House	36	1	0.0	59.6	66	59.6	12	----	59.6	0.0	5	-5.0
R-22: Represented by R7	37	1	0.0	62.7	66	62.7	12	----	62.7	0.0	5	-5.0
R-23: Represented by R7	38	1	0.0	62.7	66	62.7	12	----	62.7	0.0	5	-5.0
R24: Represented by R7	39	1	0.0	53.4	66	53.4	12	----	53.4	0.0	5	-5.0

RESULTS: SOUND LEVELS

09-213400

R25: Represented by R7	40	1	0.0	51.5	66	51.5	12	----	51.5	0.0	5	-5.0
R-26: Represented by R7	41	1	0.0	59.2	66	59.2	12	----	59.2	0.0	5	-5.0
R27: Represented by R12	42	1	0.0	50.9	66	50.9	12	----	50.9	0.0	5	-5.0
R28: Represented by R12	43	1	0.0	45.6	66	45.6	12	----	45.6	0.0	5	-5.0
R29: Represented by R12	44	1	0.0	44.7	66	44.7	12	----	44.7	0.0	5	-5.0
R30: Represented by R12	45	1	0.0	52.0	66	52.0	12	----	52.0	0.0	5	-5.0
R31: Represented by R12	46	1	0.0	49.7	66	49.7	12	----	49.7	0.0	5	-5.0
R32: Represented by R12	47	1	0.0	44.4	66	44.4	12	----	44.4	0.0	5	-5.0
R33: Represented by R12	48	1	0.0	43.6	66	43.6	12	----	43.6	0.0	5	-5.0
R34: Represented by R12	49	1	0.0	47.3	66	47.3	12	----	47.3	0.0	5	-5.0
R35: Represented by R12	50	1	0.0	42.2	66	42.2	12	----	42.2	0.0	5	-5.0
R36: Represented by R9	51	1	0.0	41.1	66	41.1	12	----	41.1	0.0	5	-5.0
R37: represented by R9	52	1	0.0	41.1	66	41.1	12	----	41.1	0.0	5	-5.0
R38: Represented by R9	53	1	0.0	55.5	66	55.5	12	----	55.5	0.0	5	-5.0
R39: Represented by R7	54	1	0.0	59.3	66	59.3	12	----	59.3	0.0	5	-5.0
R40: 295 West Lake St. first SFR	55	1	0.0	55.4	66	55.4	12	----	55.4	0.0	5	-5.0
R41: 295 West Lake St. second SFR	56	1	0.0	55.3	66	55.3	12	----	55.3	0.0	5	-5.0
R42: 300 West Lake St. SFR	57	1	0.0	55.4	66	55.4	12	----	55.4	0.0	5	-5.0
R43: 45 Shop St. first SFR	58	1	0.0	63.2	66	63.2	12	----	63.2	0.0	5	-5.0
R44: 695 HWY 395 SFR	59	1	0.0	53.4	66	53.4	12	----	53.4	0.0	5	-5.0
R45: 641 School Rd. SFR	60	1	0.0	40.9	66	40.9	12	----	40.9	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	45	0.0	0.0	0.0
All Impacted	4	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Caltrans
Allam Alhabaly

30 April 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 09-213400
RUN: Olancha noise study-Existing
BARRIER DESIGN: INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS: 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1: 299 s Pine SFR	1	1	0.0	57.7	66	57.7	10	----	57.7	0.0	8	-8.0
R2: Behive Hut in front of R1 Commercial	2	1	0.0	52.8	66	52.8	10	----	52.8	0.0	8	-8.0
R3: Sierra and Whitney St SFR	3	1	0.0	57.7	66	57.7	10	----	57.7	0.0	8	-8.0
R4: 497 Lacey Lane SFR	4	1	0.0	40.4	66	40.4	10	----	40.4	0.0	8	-8.0
R5: 301 Olanch Lane SFR	5	1	0.0	47.7	66	47.7	10	----	47.7	0.0	8	-8.0
R-6: 100 Olancha Lane SFR	6	1	0.0	51.8	66	51.8	10	----	51.8	0.0	8	-8.0
R7: Printing business	7	1	0.0	63.2	66	63.2	10	----	63.2	0.0	8	-8.0
R8: Olanch School	8	1	0.0	52.0	66	52.0	10	----	52.0	0.0	8	-8.0
R9: Fall St/Summer ST Intchange SFR	9	1	0.0	39.8	66	39.8	10	----	39.8	0.0	8	-8.0
R10: Near fall St./Summer Rd. SFR	17	1	0.0	40.6	66	40.6	10	----	40.6	0.0	8	-8.0
R11: Near Existing SR-395 SFR	18	1	0.0	44.6	66	44.6	10	----	44.6	0.0	8	-8.0
R12: Deepest home off of Williams Rd. SFR	22	1	0.0	40.6	66	40.6	10	----	40.6	0.0	8	-8.0
R13: Ranch Motel	24	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
R14: Ranch Motel	26	1	0.0	56.5	66	56.5	10	----	56.5	0.0	8	-8.0
R15: Rv Park front	28	1	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0
R16: Rv Park back	29	1	0.0	55.8	66	55.8	10	----	55.8	0.0	8	-8.0
R17: Represented by R3	30	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
R18: Represented by R4	31	1	0.0	46.1	66	46.1	10	----	46.1	0.0	8	-8.0
R19: Represented by R6	32	1	0.0	61.4	66	61.4	10	----	61.4	0.0	8	-8.0
R-20: Represented by R4	33	1	0.0	39.8	66	39.8	10	----	39.8	0.0	8	-8.0
R21: Historic school House	34	1	0.0	55.5	66	55.5	10	----	55.5	0.0	8	-8.0
R-22: Represented by R7	35	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0
R-23: Represented by R7	36	1	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0
R24: Represented by R7	37	1	0.0	52.6	66	52.6	10	----	52.6	0.0	8	-8.0

RESULTS: SOUND LEVELS

R25: Represented by R7	38	1	0.0	49.7	66	49.7	10	----	49.7	0.0	8	-8.0
R-26: Represented by R7	39	1	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0
R27: Represented by R12	40	1	0.0	50.8	66	50.8	10	----	50.8	0.0	8	-8.0
R28: Represented by R12	42	1	0.0	44.6	66	44.6	10	----	44.6	0.0	8	-8.0
R29: Represented by R12	43	1	0.0	43.7	66	43.7	10	----	43.7	0.0	8	-8.0
R30: Represented by R12	44	1	0.0	52.1	66	52.1	10	----	52.1	0.0	8	-8.0
R31: Represented by R12	45	1	0.0	49.5	66	49.5	10	----	49.5	0.0	8	-8.0
R32: Represented by R12	46	1	0.0	43.3	66	43.3	10	----	43.3	0.0	8	-8.0
R33: Represented by R12	47	1	0.0	42.5	66	42.5	10	----	42.5	0.0	8	-8.0
R34: Represented by R12	48	1	0.0	46.6	66	46.6	10	----	46.6	0.0	8	-8.0
R35: Represented by R12	49	1	0.0	40.8	66	40.8	10	----	40.8	0.0	8	-8.0
R36: Represented by R9	50	1	0.0	39.6	66	39.6	10	----	39.6	0.0	8	-8.0
R37: represented by R9	51	1	0.0	39.5	66	39.5	10	----	39.5	0.0	8	-8.0
R38: Represented by R9	52	1	0.0	53.3	66	53.3	10	----	53.3	0.0	8	-8.0
R39: Represented by R7	53	1	0.0	58.0	66	58.0	10	----	58.0	0.0	8	-8.0
R40: 295 West Lake St. first SFR	54	1	0.0	48.4	66	48.4	10	----	48.4	0.0	8	-8.0
R41: 295 West Lake St. second SFR	55	1	0.0	46.8	66	46.8	10	----	46.8	0.0	8	-8.0
R42: 300 West Lake St. SFR	56	1	0.0	45.8	66	45.8	10	----	45.8	0.0	8	-8.0
R43: 45 Shop St. first SFR	57	1	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0
R44: 695 HWY 395 SFR	58	1	0.0	53.7	66	53.7	10	----	53.7	0.0	8	-8.0
R45: 641 School Rd. SFR	59	1	0.0	39.3	66	39.3	10	----	39.3	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	45	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

RESULTS: SOUND LEVELS

09-213400

Caltrans
Allam Alhabaly

30 April 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 09-213400
RUN: Olancha/No-Build-No Build
BARRIER DESIGN: INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS: 68 deg F, 50% RH

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1: 299 s Pine SFR	1	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
R2: Behive Hut in front of R1 Commercial	2	1	0.0	53.2	66	53.2	10	----	53.2	0.0	8	-8.0
R3: Sierra and Whitney St SFR	3	1	0.0	59.0	66	59.0	10	----	59.0	0.0	8	-8.0
R4: 497 Lacey Lane SFR	4	1	0.0	41.7	66	41.7	10	----	41.7	0.0	8	-8.0
R5: 301 Olanch Lane SFR	5	1	0.0	49.0	66	49.0	10	----	49.0	0.0	8	-8.0
R-6: 100 Olancha Lane SFR	6	1	0.0	53.2	66	53.2	10	----	53.2	0.0	8	-8.0
R7: Printing business	7	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
R8: Olanch School	8	1	0.0	53.3	66	53.3	10	----	53.3	0.0	8	-8.0
R9: Fall St/Summer ST Intchange SFR	9	1	0.0	41.1	66	41.1	10	----	41.1	0.0	8	-8.0
R10: Near fall St./Summer Rd. SFR	17	1	0.0	41.9	66	41.9	10	----	41.9	0.0	8	-8.0
R11: Near Existing SR-395 SFR	18	1	0.0	46.0	66	46.0	10	----	46.0	0.0	8	-8.0
R12: Deepest home off of Williams Rd. SFF	22	1	0.0	41.9	66	41.9	10	----	41.9	0.0	8	-8.0
R13: Ranch Motel	24	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0
R14: Ranch Motel	26	1	0.0	57.8	66	57.8	10	----	57.8	0.0	8	-8.0
R15: Rv Park front	28	1	0.0	64.6	66	64.6	10	----	64.6	0.0	8	-8.0
R16: Rv Park back	46	1	0.0	57.1	66	57.1	10	----	57.1	0.0	8	-8.0
R17: Represented by R3	47	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
R18: Represented by R4	48	1	0.0	47.4	66	47.4	10	----	47.4	0.0	8	-8.0
R19: Represented by R6	49	1	0.0	62.7	66	62.7	10	----	62.7	0.0	8	-8.0
R-20: Represented by R4	50	1	0.0	41.1	66	41.1	10	----	41.1	0.0	8	-8.0
R21: Historic school House	51	1	0.0	56.8	66	56.8	10	----	56.8	0.0	8	-8.0
R-22: Represented by R7	52	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
R-23: Represented by R7	53	1	0.0	60.8	66	60.8	10	----	60.8	0.0	8	-8.0
R24: Represented by R7	54	1	0.0	53.9	66	53.9	10	----	53.9	0.0	8	-8.0

RESULTS: SOUND LEVELS

R25: Represented by R7	56	1	0.0	51.0	66	51.0	10	----	51.0	0.0	8	-8.0
R-26: Represented by R7	59	1	0.0	62.0	66	62.0	10	----	62.0	0.0	8	-8.0
R27: Represented by R12	60	1	0.0	52.1	66	52.1	10	----	52.1	0.0	8	-8.0
R28: Represented by R12	61	1	0.0	45.9	66	45.9	10	----	45.9	0.0	8	-8.0
R29: Represented by R12	63	1	0.0	45.0	66	45.0	10	----	45.0	0.0	8	-8.0
R30: Represented by R12	64	1	0.0	53.4	66	53.4	10	----	53.4	0.0	8	-8.0
R31: Represented by R12	65	1	0.0	50.8	66	50.8	10	----	50.8	0.0	8	-8.0
R32: Represented by R12	66	1	0.0	44.6	66	44.6	10	----	44.6	0.0	8	-8.0
R33: Represented by R12	67	1	0.0	43.8	66	43.8	10	----	43.8	0.0	8	-8.0
R34: Represented by R12	68	1	0.0	48.0	66	48.0	10	----	48.0	0.0	8	-8.0
R35: Represented by R12	70	1	0.0	42.1	66	42.1	10	----	42.1	0.0	8	-8.0
R36: Represented by R9	71	1	0.0	40.9	66	40.9	10	----	40.9	0.0	8	-8.0
R37: represented by R9	72	1	0.0	40.8	66	40.8	10	----	40.8	0.0	8	-8.0
R38: Represented by R9	73	1	0.0	54.6	66	54.6	10	----	54.6	0.0	8	-8.0
R39: Represented by R7	74	1	0.0	59.3	66	59.3	10	----	59.3	0.0	8	-8.0
R40: 295 West Lake St. first SFR	75	1	0.0	49.2	66	49.2	10	----	49.2	0.0	8	-8.0
R41: 295 West Lake St. second SFR	76	1	0.0	47.4	66	47.4	10	----	47.4	0.0	8	-8.0
R42: 300 West Lake St. SFR	77	1	0.0	46.2	66	46.2	10	----	46.2	0.0	8	-8.0
R43: 45 Shop St. first SFR	78	1	0.0	62.0	66	62.0	10	----	62.0	0.0	8	-8.0
R44: 695 HWY 395 SFR	79	1	0.0	55.0	66	55.0	10	----	55.0	0.0	8	-8.0
R45: 641 School Rd. SFR	80	1	0.0	40.6	66	40.6	10	----	40.6	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	45	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Water Quality Report and Addendum

State of California
Department of Transportation

Memorandum

Flex your power!
Be energy efficient!

To: MATHEW PALMER
Southern Sierra Environmental Analysis Branch

Date: August 27, 2008
File: EA 09-213400
Inyo-395
PM 29.2/41.8

From: GERALD WHITE 8/27/08
Branch Chief
Central Region Hazardous Waste and Paleontology Branch

Subject: **Update of Water Quality Scoping for the Olancha-Cartago 4 Lane Widening Project, Highway 395, Inyo County**

OBJECTIVES

The objective of this water quality scoping is to evaluate potential impacts of the proposed project on water quality. The water quality scoping identifies impacts on surface water and groundwater resources resulting from project activities that might trigger a full water quality assessment. This water quality scoping is being updated to include Alternative 4 and reflect the new project description.

Project Description

The California Department of Transportation is proposing a new four-lane highway in Inyo County, on U.S. Highway 395 near the towns of Olancha and Cartago. The project extends from the existing four-lane highway segment just south of the Los Angeles Aqueduct Bridge No. 48-10 at post mile 30.8 north to the four-lane segment at the Ash Creek Bridge No. 48-11, post mile 41.8. The project is approximately 11.1 miles long. Five build alternatives are being considered and one no build alternative.

Alternative 1

This alternative proposes constructing segments of conventional all-paved, conventional divided, and controlled access four-lane divided highway. The project will provide for route continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

South End of the Project – Sage Flat Four Lane (0.15 miles south of LA Aqueduct Bridge #48-10 PM 30.8) - Controlled access four-lane divided highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west separated by a 100 ft. median.

0.6 Miles south of Cactus Flat Road (PM 32.1) - Conventional all-paved four-lane highway is proposed. The existing highway will be widened with northbound and southbound lanes separated by a 14 foot two way left turn lane (TWLTL).

1 mile north of the State Route 190 junction (PM 35.7) - Conventional divided four-lane highway is proposed. The existing highway will be widened to the west with northbound and southbound lanes separated by a 100 ft. unpaved median. An at-grade crossing, acceleration, and deceleration lanes will be provided to truck traffic at the bottling plant. Access control will be purchased along the western right-of-way.

0.45 miles south of Whitney Street (PM 37.4) - Conventional four-lane highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west separated by a 14- foot two way left turn lane (TWLTL).

0.4 miles north of Whitney Street (PM 38.2) - Controlled access four-lane divided highway is proposed.. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the east separated by at least a 100 ft. median. Lanes will be constructed to avoid existing steel transmission line towers.

2.2 miles north of Whitney Street (PM 40.0) - Controlled access four-lane divided highway is proposed.. The existing lanes will be used for southbound traffic, and new northbound lanes will be constructed to the east separated by at least a 100- ft. median.

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) (PM 41.8) - Olancha and Cartago consist primarily of residential units. Olancha is situated mostly west of 395 and Cartago is mostly east of existing 395. Cartago has a honey warehouse and a water bottling plant just south of the community. With improvements along the existing alignment, both communities will be impacted due to the narrowness of the existing right of way.

Alternative 2:

This alternative proposes construction of a controlled access four-lane divided expressway with the northbound and southbound lanes separated by at least a 100 ft. wide median throughout the project. The project will provide for route continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

South End of the Project – Sage Flat Four Lane (0.15 miles south of LA Aqueduct Bridge #48-10) (PM 30.8) -

Controlled access four-lane divided highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west.

1.1 miles south of Cactus Flat Road (PM 31.6) - New northbound and southbound lanes will be constructed to the east of the existing highway, and the existing highway will be used as a frontage road.

0.2 miles south of the Junction of State Route 190 (PM 34.5) - New northbound and southbound lanes will be constructed to the west of the existing highway. The existing highway will be used as a frontage road.

0.7 miles south of Whitney Street (PM 37.1) - Existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west.

0.4 miles north of Whitney Street (PM 38.2) - Similar to alternative 1

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) PM 41.8

Alternative 2A

This alternative is a variation of Alternative 2, and proposes that the controlled access divided four-lane expressway be constructed to the west of the community of Cartago with the northbound and southbound lanes separated by at least a 100 ft. wide median throughout.

South End of the Project – Sage Flat Four Lane (0.15 miles south of LA Aqueduct Bridge #48-10 PM 30.8) - Similar to Alternative 2.

1 mile north of the State Route 190 junction (PM 35.7) - Proposed that the new northbound and southbound lanes be constructed to the west of the community of Cartago.

0.8 miles north of Whitney Street (PM 38.6) - Similar to Alternative 1.

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) PM 41.8

Alternative 3

This alternative proposes construction of a controlled access divided four-lane expressway to the west of the community of Olancha with the northbound and southbound lanes separated by at least a 100 ft. wide median throughout the project. The project will provide for route continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

South End of the Project – Sage Flat Four Lane (0.15 miles south of LA Aqueduct Bridge #48-10 PM 30.8) - Existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west.

0.5 Miles south of Cactus Flat Road (PM 32.2) - New northbound and southbound lanes are proposed to be constructed to the west of the community of Olancha, near the L. A. Aqueduct. The junction with State Route 190 will be extended to the west to connect with the new lanes. A CTC approved Route Redesignation is required if the terminus of SR 190 is altered by Alt 3.

0.6 miles north of Whitney Street (PM 37.2) - Similar to alternative 1

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) PM 41.8

Alternative 4

South End of the Project – Sage Flat Four Lane (1.1 miles south of LA Aqueduct Bridge #48-10 PM 30.8) - Alignment 4 will be 2 lanes NB and 2 lanes SB with a 100 foot unpaved median from PM 29.75 to north of Cartago. North of Cartago the median will vary so as to thread existing utilities. Shoulders will be 10 foot outside and 5 foot inside with a 20 foot clear recovery zone inboard and outboard. All curves are 3800 foot radius or larger. This alignment will eliminate a small group of trees and a spring as it is. Land taken is almost entirely Agency land (BLM, Forest service, LADWP). Access will be controlled by a right-of-way fence. The new road will bear west of the current alignment at PM 29.75 and tie in approximately with the old railroad grade. The road will continue north along the west side of the LA aqueduct. At a point just west of Cartago the road will bridge the aqueduct and angle back into the current alignment at PM 41.8.

Highway 190 will be extended along Fall Road, bridge the aqueduct and tie into alignment 4 with at-grade crossings. A CTC approved Route Redesignation is required if the terminus of SR 190 is altered by Alt 3 or 4.

Access Control will be purchased and the route will be designated Expressway. All INYO 395 from start to end will be relinquished to Inyo County. Because this is a new alignment the route will require adoption by the CTC. The new alignment will be denominated as "Controlled Access Highway".

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) PM 41.8

No Build Alternative

This alternative is the "No Build" option and proposes to leave the facility as it currently exists. This alternative does not provide relief from the existing deficiencies or address the operational improvements this project seeks to deliver.

Alternatives 1, 2, 2a, and 3 were included in the original study area and were previously scoped in 2001. A Natural Environment Study was performed in 2003 and potential wetland issues were identified. The results of the study were given to the Caltrans design engineer and all proposed project build alternatives were designed to not affect any wetlands. The original scoping concluded that by incorporating Best Management Practices (BMPs), this project will not have an adverse impact on water quality in the project area. Alternative 3a was scoped in 2006 and the conclusions were similar to the previous scoping.

The project development team has decided to add a fourth alternative that bypasses the cities of Olancha and Cartago. This alternative, Alternative 4, is located to west of the previously proposed alternatives and it follows the old Southern Pacific Railroad alignment. This is the West Study Area. The project team has also decided to drop Alternative 3a from consideration.

Included in the West Study Area are proposed borrow areas for material to construct the selected alternative. The West Study Area is located adjacent to and west of the original Study Area.

Water Quality

The West Study Area is located within the Lower Owens Hydrologic area (Hydrologic Unit No. 603.03). A review of United States Geological Survey topographic maps indicates three predominant streams traverse the study area (Cartago Creek, Ash Creek, and Olancha Creek). A number of unnamed streams also traverse the study area and mainly flow from west to east. The Los Angeles Aqueduct is situated within the West Study Area.

Maps from a report on the Western Water Company Olancha Water Development Project prepared by PSOMAS in 1999 indicate that several groundwater wells are located near the study area. The groundwater in Owens Valley is used to feed the Los Angeles Aqueduct and a bottled water company has a bottling plant in Olancha. The groundwater in the study area is of high quality and has a Municipal use designation in the Lahaton Regional Water Quality Control Board Basin Plan.

A review of topographic maps indicate a number of springs and seeps near the study area which may indicate that groundwater at those locations is shallow. The project description identifies one spring that Alternate 4 will pass over.

The Lahonton Regional Water Control Board (RWQCB) has established water quality objectives for the protection of surface and groundwater in the region. Water quality objectives consist of both narrative and numerical goals, and are established to preserve past, present and probable future beneficial uses of regional water bodies. The subject area is discussed in detail, and this update is based on written directives contained in the Water Quality Control Plan (Basin Plan) for the Lahonton Region Basin - Second Edition (revised 1994 with approved amendments).

PERMITS

Dredge and Fill Permits. Section 404 of the Federal Clean Water Act regulates the discharge of dredged and fill materials into waters of the United States, including wetlands. The term "discharge of dredged and fill material" has been defined broadly to include the building of any structure involving rock, sand, dirt, or other construction material. No discharge may occur unless a permit is obtained from the U.S. Army Corps of Engineers. Generally, the project proponent must agree to mitigate or have plans to mitigate environmental impacts caused by the project before a permit is issued. The U.S. Environmental Protection Agency has the authority to veto permits issued by the Corps for projects that have unacceptable adverse effects on municipal water supplies, fisheries, wildlife, or recreational areas.

This permit may be required depending on if work is going to be conducted in the stream channel or while crossing the aqueduct.

In California, USEPA has delegated NPDES permitting authority to the SWRCB and the nine RWQCBs. The SWRCB has issued a Statewide NPDES permit and Waste Discharge Requirements (WDRs) to Caltrans for stormwater and non-stormwater runoff.

All projects are covered by the Caltrans Statewide NPDES Permit No. CAS000003 (SWRCB No. 99-06-DWQ). Under this permit the required Statewide Storm Water Management Plan directs that potential impacts to water quality (erosion, discharges of hazardous material, disruption of natural drainage patterns, etc.) be addressed in the planning, design, and construction phases. In the project development phases, plans need to be developed to insure that there will be no detrimental discharge into any body of water. In the construction phase, the contractor has responsibility, as stated in Caltrans' Standard Specifications Section 7-1.01G, to take necessary steps to eliminate potential impacts during construction.

Standard Specifications, Section 7-1.01G requires the construction contractor to implement pollution control practices related to construction projects via a Water Pollution Control Program (WPCP) or a Storm Water Pollution Prevention Plan (SWPPP).

Presently, when a project is expected to disturb more than one acre of soil, the following is required:

1. A Notification of Construction (NOC) is to be submitted to the appropriate RWQCB at least 30 days prior to the start of construction. (In District 6 the NOC is usually prepared and submitted by the Project Engineer.) The NOC form asks for tentative start date and duration, location, description of project, estimate of affected area, resident engineer (or other construction contact) with telephone number, etc.

2. A Storm Water Pollution Prevention Plan (SWPPP) is to be prepared and implemented during construction to the satisfaction of the Resident Engineer.

3. A Notice of Construction Completion (NOCC) is to be submitted to the RWQCB upon completion of the construction and stabilization of the site. A project will be considered complete when the criteria for final stabilization in the State General Construction Permit is met.

If a project is less than 1 acre, it will utilize a WPCP.

This project will disturb more than one acre of soil so a SWPPP will need to be developed and a NOC and a NOCC will need to be submitted.

CONCLUSIONS AND RECOMMENDATION

The greatest potential for impact to water quality is during construction due to erosion and sedimentation. Following the SWPPP will eliminate or reduce any potential impact to surface water quality.

If groundwater is shallow, which may be indicated by the presence of springs and seeps in the area, the borrow sites may have to be dewatered in order to get the required volume of material. This dewatering would only occur during construction and would be limited in duration, and therefore should have no long-term effect on groundwater quality. If dewatering is necessary, the Stormwater section should be consulted on the proper disposition of the water.

If the selected alternative is constructed over a spring, the Hydraulic section should be consulted to address the possibility of water under the roadway.

Any groundwater wells encountered during the construction of the selected alternative should be properly abandoned in accordance with State and local regulations.

In view of the above information, it is our opinion that no significant impacts to surface water or groundwater quality are anticipated and no further investigation is needed to proceed with the project.

In the event that the scope of work changes, please request additional investigation for this project. If you have any questions, please contact Terrence A. Fox, Engineering Geologist at (559) 243-8317. For specific questions involving specific stormwater quality issues please contact our NPDES/Storm Water Quality Branch at (559) 243-3565.

State of California
Department of Transportation

Memorandum

Flex your power!
Be energy efficient!

To: MATHEW PALMER
Southern Sierra Environmental Analysis Branch

Date: March 3, 2010
File: EA 09-213400
Inyo-395
PM 29.2/41.8

From: JUERGEN VESPERMANN
Branch Chief
Central Region Hazardous Waste and Paleontology Branch

Subject: **Update of Water Quality Scoping for the Olancha-Cartago 4 Lane Widening Project, Highway 395, Inyo County**

OBJECTIVES

The objective of this water quality scoping is to evaluate potential impacts of the proposed project on water quality. The water quality scoping identifies impacts on surface water and groundwater resources resulting from project activities that might trigger a full water quality assessment. This water quality scoping is being updated to include Alternative 4 and reflect the new project description.

Project Description

The California Department of Transportation and the Federal Highway Administration proposes to convert approximately 12.7 miles of the existing two-lane conventional highway into a four-lane expressway or partial conventional four-lane highway from post miles 29.2 to 41.8 in Inyo County. The project proposes 5 alternatives with some on new alignments. Portions of the existing road may be used as part of the proposed alternatives, relinquished to the county, or removed. The new facility would have four 12-foot lanes and a variable median width. There will be 5-foot inside and 10-foot outside paved shoulders throughout the project. This project also proposes constructing new concrete bridges to cross the Los Angeles Aqueduct, and installing concrete box culverts and smaller pipe culverts throughout the project limits to promote drainage. Depending on the alternative selected, this project proposes to extend State Route 190 to intersect with the proposed improvements. A borrow site adjacent to Alternative 4 will be used to provide soil and road materials for the project.

Alternatives: Five build alternatives and the "no-build" alternative are proposed for evaluation and study, and may include slight variations. Briefly, these are described as follows:

<u>Alternative 1</u>
This alternative proposes constructing segments of conventional all-paved, conventional divided, and controlled access four-lane divided highway. The project will provide for facility continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

South End of the Project – Sage Flat Four Lane (0.45 miles south of LA Aqueduct Bridge #48-10 PM 30.8)
Controlled access four-lane divided highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west separated by a 100 ft. median. This segment is the same for alternatives 1 thru 3.

0.6 Miles south of Cactus Flat Road (PM 32.1)
Conventional all-paved four-lane highway is proposed. The existing highway will be widened with northbound and southbound lanes separated by a 14 foot paved median.
1 mile north of the State Route 190 junction (PM 35.7)
Conventional divided four-lane highway is proposed. The existing highway will be widened to the west with northbound and southbound lanes separated by a 100 ft. unpaved median. An at-grade crossing, acceleration, and deceleration lanes will be provided to truck traffic at the bottling plant. Access control will be purchased along the western right-of-way.

0.5 miles south of Whitney Street (PM 37.2)
Conventional four-lane highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west separated by a 14-foot paved median.

0.6 miles north of Whitney Street (PM 38.4)
Controlled access four-lane divided highway is proposed. The existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the east separated by at least a 100 ft. median. Lanes will be constructed to avoid existing steel transmission line towers.

2.2 miles north of Whitney Street (PM 40.0)
Controlled access four-lane divided expressway is proposed. The existing lanes will be used for southbound traffic, and new northbound lanes will be constructed to the east separated by at least a 100-ft. median.

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) (PM 41.8)
Olancha and Cartago consist primarily of residential units. Olancha is situated mostly west of 395 and Cartago is mostly east of existing 395. Cartago has a honey warehouse and a water bottling plant just south of the community. Improvements exist on both sides of the current alignment and both communities will have to relinquish private land to widen the right-of-way.

This alternate will affect the Ranch House Café, which offers little clearance for the widening of four lanes centered on the existing alignment. Construction of the new segment symmetrically about the existing centerline would place the edge of the pavement within 16 feet of the Ranch House Café. Currently, trucks park off the roadway within the unpaved shoulder area. Parking will be greatly affected for the trucks if Alternative 1 is selected.

<u>Alternative 2</u>
This alternative proposes construction of a controlled access four-lane divided expressway with the northbound and southbound lanes separated by at least a 100 ft. wide median throughout the project. The project will provide for facility continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

South End of the Project – Sage Flat Four Lane (0.45 miles south of LA Aqueduct Bridge #48-10) (PM 30.8)
Same as alternative 1

1.1 miles south of Cactus Flat Road (PM 31.6)
New northbound and southbound lanes will be constructed to the east of the existing highway, and the existing highway will be relinquished to Inyo County.

0.2 miles south of the Junction of State Route 190 (PM 34.5)
New northbound and southbound lanes will be constructed to the west of the existing highway. The existing highway will be relinquished to Inyo County.

0.5 miles south of Whitney Street (PM 37.2)
Existing lanes will be used for northbound traffic, and new southbound lanes will be constructed to the west.

0.6 miles north of Whitney Street (PM 38.4)
Same as alternative 1

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) PM 41.8

__Alternative 2A__

This alternative is a variation of Alternative 2, and proposes that the controlled access divided four-lane expressway be constructed to the west of the community of Cartago with the northbound and southbound lanes separated by at least a 100 ft. wide median throughout.

South End of the Project – Sage Flat Four Lane (0.45 miles south of LA Aqueduct Bridge #48-10 PM 30.8)

Same as Alternative 2.

0.8 mile north of the State Route 190 junction (PM 35.5)

Proposed that the new northbound and southbound lanes be constructed to the west of the community of Cartago.

0.8 miles north of Whitney Street (PM 38.6)

Similar to Alternative 1.

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) PM 41.8

__Alternative 3__

This alternative proposes construction of a controlled access divided four-lane expressway to the west of the community of Olancha with the northbound and southbound lanes separated by at least a 100 ft. wide median throughout the project. The project will provide for facility continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north. Throughout the project inside shoulder width will be 5 feet and outside will be 10 feet.

South End of the Project – Sage Flat Four Lane (0.45 miles south of LA Aqueduct Bridge #48-10 PM 30.8)

Same as Alternative 1.

0.5 Miles south of Cactus Flat Road (PM 32.2)

New northbound and southbound lanes are proposed to be constructed to the west of the community of Olancha, near the L. A. Aqueduct. The junction with State Route 190 will be extended to the west to connect with the new lanes. A CTC approved Route Redesignation is required if the terminus of SR 190 is altered by Alt 3. (PDPM Chapter 23, Article 7)

0.6 miles south of Whitney Street (PM 37.2)

Same as alternative 2

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) PM 41.8

Alternative 4

South End of the Project – Sage Flat Four Lane (1.5 miles south of LA Aqueduct Bridge #48-10 PM 29.75)

Alignment 4 will be a new alignment west of the LA Aqueduct. A 4 lane divided expressway with a 100 foot median will be constructed from PM 29.75 to the northern limit of Cartago. North of Cartago the median will be 100 feet or wider so as to thread existing utilities. Land necessary for right-of-way is almost entirely Agency land (BLM, Forest service, LADWP). Access will be controlled by a right-of-way fence. The new road will bear west of the current alignment near PM 29.75 and tie in approximately with the old railroad grade. The road will continue north along the west side of the LA aqueduct. At a point just west of Cartago the road will bridge the aqueduct and angle back toward the current alignment. North of PM 38.6 alternative 4 will become similar to the other alternatives. Access control will be purchased and the route will be designated Expressway. This is a new alignment and will require adoption by the CTC. The new alignment will be denominated as "Controlled Access Highway" by a "Controlled Access Highway Agreement".

All of the existing U.S. 395 within the project construction area may be relinquished to Inyo County or some of it may become part of SR 190. A CTC approved Route Redesignation is required if the terminus of SR 190 is altered by the selection of Alt 3 or Alt 4.

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) PM 41.8

No Build Alternative

This alternative is the "No Build" option and proposes to leave the facility as it currently exists. This alternative does not provide relief from the existing deficiencies or address the operational improvements this project seeks to deliver.

Alternatives Considered but Withdrawn

Alternative 2R

This alternative would have followed the same alignment as Alternative 2, except that the alignment would have continued past State Route 190 (PM 34.4) on the east side of the existing highway up to about PM 35.75, where it would have crossed over to the west of the existing highway and back to the proposed alignment for Alternative 2. This alignment would have significantly reduced the right of way impacts, the cost of construction, and some of the environmental impacts. However, jurisdictional wetlands were determined to be present in the pasturelands to the east of the existing highway. Since jurisdictional wetlands must be avoided, this alternative was removed from consideration.

Alternative 3a

Alternative 3a is identical to Alternative 3 except it does not intersect with the existing alignment in Cartago at Post Mile 37.6. Like Alternative 2a, Alternative 3a bypasses Cartago by following an existing railroad grade around and west of Cartago. It would transition back to the existing highway alignment at the same location depicted in Alternative 2a north of Cartago, near Post Mile 38.5. From this point north, Alternative 3a would be identical to Alternative 3. This alternative was withdrawn from further consideration because of its impacts on cultural resources.

Alternatives 1, 2, 2a, and 3 were included in the original study area and were previously scoped in 2001. A Natural Environment Study was performed in 2003 and potential wetland issues were identified. The results of the study were given to the Caltrans design engineer and all proposed project build alternatives were designed to not affect any wetlands. The original scoping concluded that by incorporating Best Management Practices (BMPs), this project will not have an adverse impact on water quality in the project area. Alternative 3a was scoped in 2006 and the conclusions were similar to the previous scoping.

The project development team has decided to add a fourth alternative that bypasses the cities of Olancha and Cartago. This alternative, Alternative 4, is located to west of the previously proposed alternatives and it follows the old Southern Pacific Railroad alignment. This is the West Study Area. The project team has also decided to drop Alternative 3a from consideration.

Included in the West Study Area are proposed borrow areas for material to construct the selected alternative. The West Study Area is located adjacent to and west of the original Study Area.

Water Quality

The West Study Area is located within the Lower Owens Hydrologic area (Hydrologic Unit No. 603.03). A review of United States Geological Survey topographic maps indicates three predominant streams traverse the study area (Cartago Creek, Ash Creek, and Olancha Creek). A number of unnamed streams also traverse the study area and mainly flow from west to east. The Los Angeles Aqueduct is situated within the West Study Area.

Maps from a report on the Western Water Company Olancha Water Development Project prepared by PSOMAS in 1999 indicate that several groundwater wells are located near the study area. The groundwater in Owens Valley is used to feed the Los Angeles Aqueduct and a bottled water company has a bottling plant in Olancha. The groundwater in the study area is of high quality and has a Municipal use designation in the Lahaton Regional Water Quality Control Board Basin Plan.

A review of topographic maps indicate a number of springs and seeps near the study area which may indicate that groundwater at those locations is shallow. The project description identifies one spring that Alternate 4 will pass over.

The Lahonton Regional Water Control Board (RWQCB) has established water quality objectives for the protection of surface and groundwater in the region. Water quality objectives consist of both narrative and numerical goals, and are established to preserve past, present and probable future beneficial uses of regional water bodies. The subject area is discussed in detail, and this update is based on written directives contained in the Water Quality Control Plan (Basin Plan) for the Lahonton Region Basin - Second Edition (revised 1994 with approved amendments).

PERMITS

Dredge and Fill Permits. Section 404 of the Federal Clean Water Act regulates the discharge of dredged and fill materials into waters of the United States, including wetlands. The term "discharge of dredged and fill material" has been defined broadly to include the building of any structure involving rock, sand, dirt, or other construction material. No discharge may occur unless a permit is obtained from the U.S. Army Corps of Engineers. Generally, the project proponent must agree to mitigate or have plans to mitigate environmental impacts caused by the project before a permit is issued. The U.S. Environmental Protection Agency has the authority to veto permits issued by the Corps for projects that have unacceptable adverse effects on municipal water supplies, fisheries, wildlife, or recreational areas.

This permit may be required depending on if work is going to be conducted in the stream channel or while crossing the aqueduct.

In California, USEPA has delegated NPDES permitting authority to the SWRCB and the nine RWQCBs. The SWRCB has issued a Statewide NPDES permit and Waste Discharge Requirements (WDRs) to Caltrans for stormwater and non-stormwater runoff.

All projects are covered by the Caltrans Statewide NPDES Permit No. CAS000003 (SWRCB No. 99-06-DWQ). Under this permit the required Statewide Storm Water Management Plan directs that potential impacts to water quality (erosion, discharges of hazardous material, disruption of natural drainage patterns, etc.) be addressed in the planning, design, and construction phases. In the project development phases, plans need to be developed to insure that there will be no detrimental discharge into any body of water. In the construction phase, the contractor has responsibility, as stated in Caltrans' Standard Specifications Section 7-1.01G, to take necessary steps to eliminate potential impacts during construction.

Standard Specifications, Section 7-1.01G requires the construction contractor to implement pollution control practices related to construction projects via a Water Pollution Control Program (WPCP) or a Storm Water Pollution Prevention Plan (SWPPP).

Presently, when a project is expected to disturb more than one acre of soil, the following is required:

1. A Notification of Construction (NOC) is to be submitted to the appropriate RWQCB at least 30 days prior to the start of construction. (In District 6 the NOC is usually prepared and submitted by the Project Engineer.) The NOC form asks for tentative start date and duration, location, description of project, estimate of affected area, resident engineer (or other construction contact) with telephone number, etc.

2. A Storm Water Pollution Prevention Plan (SWPPP) is to be prepared and implemented during construction to the satisfaction of the Resident Engineer.

3. A Notice of Construction Completion (NOCC) is to be submitted to the RWQCB upon completion of the construction and stabilization of the site. A project will be considered complete when the criteria for final stabilization in the State General Construction Permit is met.

If a project is less than 1 acre, it will utilize a WPCP.

This project will disturb more than one acre of soil so a SWPPP will need to be developed and a NOC and a NOCC will need to be submitted.

CONCLUSIONS AND RECOMMENDATION

The greatest potential for impact to water quality is during construction due to erosion and sedimentation. Following the SWPPP will eliminate or reduce any potential impact to surface water quality.

If groundwater is shallow, which may be indicated by the presence of springs and seeps in the area, the borrow sites may have to be dewatered in order to get the required volume of material. This dewatering would only occur during construction and would be limited in duration, and therefore should have no long-term effect on groundwater quality. If dewatering is necessary, the Stormwater section should be consulted on the proper disposition of the water.

If the selected alternative is constructed over a spring, the Hydraulic section should be consulted to address the possibility of water under the roadway.

Any groundwater wells encountered during the construction of the selected alternative should be properly abandoned in accordance with State and local regulations.

In view of the above information, it is our opinion that no significant impacts to surface water or groundwater quality are anticipated and no further investigation is needed to proceed with the project.

In the event that the scope of work changes, please request additional investigation for this project. If you have any questions, please contact Terrence A. Fox, Engineering Geologist at (559) 243-8317. For specific questions involving specific stormwater quality issues please contact our NPDES/Storm Water Quality Branch at (559) 243-3565.

Natural Environment Study and Addendums

Olancha/Cartago Four-lane Project

Natural Environment Study

Olancha/Cartago Four-lane Project

Inyo County, California

09-INY-395-KP 50/76.2 (PM 30.8/41.8)
EA 09-213400
JUNE 2003

For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Tom Dayak, Eastern Sierra Environmental Branch, 500 South Main Street, Bishop CA 93514; (760) 872-0690 Voice, or use the California Relay Service TTY number, (760) 872-9043.

Natural Environment Study

Including Biological Evaluation

Inyo County, California

09-INY-395-KP 50/67.2 (PM 30.9/41.8)

EA 09-213400

JUNE 2003

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Summary

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) are proposing a new four-lane highway in Inyo County, on Highway 395 near the towns of Olancha and Cartago. The project extends from the existing four-lane highway segment just south of the Los Angeles Aqueduct Bridge No. 48-10 at KP 49.5 (PM 30.8) north to the four-lane segment at the Ash Creek Bridge No. 48-11 KP 67.4 (PM 41.9). The project is approximately 17.9 km (11.1 mi) long. The proposed project will upgrade the existing two-lane conventional highway to a four-lane expressway or partial conventional four-lane highway, which will improve the Level of Service (LOS), ease congestion, and improve the overall safety of the highway in the area. There are six alternatives proposed: five build alternatives and one no-action.

The effects of each proposed alternative of the Olancha/Cartago four-lane project on rare, threatened, and endangered species and sensitive habitats are summarized in Table 1. There would not be direct effects to any other species or communities mentioned in this document.

Table 1. Summary of effects by build alternative. Species or natural communities not included will not be directly affected.

Species or community	Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Alternative 3a
Area within right-of-way in ha (ac)					
Fremont Cottonwood Series	0.11 (0.26)	0.76 (1.87)	1.02 (2.53)	1.03 (2.54)	1.31 (3.23)
Greasewood Series	0.24 (0.59)	0	0	0	0
Pygmy poppy *Canbya candida* (occupied habitat)	0	0	2.27 (5.60)	0	2.30 (5.59)
Mohave ground squirrel *Spermophilus Mohavensis* (assumed habitat)	20.6 (50.8)	34.1 (84.3)	34.1 (84.3)	24.8 (61.2)	24.8 (61.2)
Number of individuals in right-of-way					
Planted trees*	35	0	0	0	0

* Planted trees include Fremont cottonwood (*Populus fremontii*) and black locust (*Robinia pseudoacacia*).

According to the vegetation classification system used by Sawyer and Keeler-Wolf (1995), 10 plant communities are present in the study area. Natural communities of special concern in the study area include those that delineated as wetlands under U.S. Army Corps of Engineers guidelines and two additional communities deemed “rare and worthy of consideration” by the California Natural Diversity Data Base (Fremont Cottonwood Series and Greasewood Series). A portion of the study area mapped as wetland is included in the Southern Owens Conservation Area identified by the draft recovery plan for the Owens Basin (U.S. Fish and Wildlife Service 1996*b*).

Caltrans has designed the alternatives to avoid all direct effects to wetlands. Indirect effects to wetlands are possible through hydrological alterations or run-off of contaminants from passing vehicles. Hydrological alterations will be minimized by the installation of culverts under the highway, which will allow stream flow to reach the wetlands downslope. Potential contaminant run-off from the new highway would be similar to current run-off from the existing highway. All new lanes will be separated from the existing lanes by at least 24.4 m (80 ft) of upland plant communities, which would act as a filter to keep contaminants from reaching the wetlands. All alternatives would affect the Fremont Cottonwood Series (Table 1) because this vegetation type crosses the entire area in an east-west orientation. Only Alternative 1 would affect the Greasewood Series (Table 1).

The only plant species of special concern that would be affected directly by any of the alternatives is pygmy poppy (*Canbya candida*), which is on the California Native Plant Society’s (CNPS) “Watch list” (List 4). Only Alternatives 2a and 3a would affect pygmy poppy directly (Table 1), and none of the alignments would affect it indirectly. Although crowned muilla (*Muilla coronata*), another plant species of special concern (CNPS List 4), was found within the study area, it would not be affected directly or indirectly by any of the proposed alignments.

Four other rare plant taxa are known to occur immediately east of the study area: sanicle cymopterus (*Cymopterus ripleyi* var. *saniculoides*), Parish’s popcorn-flower (*Plagiobothrys parishii*), Owens Valley checkerbloom (*Sidalcea covillei*), and alkali cord grass (*Spartina gracilis*). The first three are on CNPS List 1B (plants rare, threatened, or endangered in California and elsewhere); alkali cord grass is on CNPS List 4. Owens Valley checkerbloom is also listed by the State of California as endangered. The proposed project would not directly affect any of these taxa because all occurrences are at least 140 m (459 ft) from any proposed alignments. Parish’s popcorn-flower, Owens Valley checkerbloom, and alkali cord grass grow in wetlands and therefore could be indirectly affected by the same hydrological factors noted above for the wetland communities. Sanicle cymopterus is not susceptible to indirect hydrological effects because it is not a wetland species, and no other indirect effects are expected.

Two additional rare plants have a high probability of occurring within the study area because they grow in the same plant communities on similar soils in other parts of the Owens Valley. These are Inyo County star-tulip (*Calochortus excavatus*) and Inyo phacelia (*Phacelia inyoensis*). Although these species were not found during these surveys, they could potentially be found in the study area in a year with higher rainfall, as could sanicle cymopterus. Relatively dry conditions during the survey period created unfavorable growing conditions for these plants. Even if these species were found in the study area, they would not be affected directly by the project because Caltrans is avoiding the wetlands where they grow. Inyo County star-tulip and Inyo phacelia could be affected indirectly by the same hydrological factors noted above for the wetland communities.

A number of planted trees including Fremont cottonwood (*Populus fremontii*) and black locust (*Robinia pseudoacacia*) grow along the existing Highway 395. Although these tree species are not rare, the shade they provide is important to the community of Olancha. Only Alternative 1 would destroy any planted trees (Table 1).

Although the plant surveys were conducted in relatively dry years, 209 plant species were found; 8 of these could be identified only to genus because the diagnostic structures were not present. Of those identified to species, 30 (14.9 percent) were non-native. Ten of the non-native species are considered to be invasive: giant reed (*Arundo donax*), wild oats (*Avena fatua*), five-horn bassia (*Bassia hyssopifolia*), red brome (*Bromus madritensis* ssp. *rubens*), cheat grass (*Bromus tectorum*), Italian ryegrass (*Lolium multiflorum*), black locust (*Robinia pseudoacacia*), Russian thistle (*Salsola tragus*), Mediterranean grass (*Schismus arabicus*), and salt cedar (*Tamarix ramosissima*). None of these is currently widespread within the study area.

The only threatened or endangered wildlife species that would be affected is the Mohave ground squirrel (*Spermophilus Mohavensis*), listed by the State of California as threatened. Estimated loss of Mohave ground squirrel habitat by alternative ranges from 20.6 ha (50.8 ac) to 34.1 ha (84.3 ac) (Table 1). Calrans is proposing to mitigate this loss of habitat at a 3:1 ratio.

Surveys to detect the desert tortoise (*Gopherus agassiziii*), listed as threatened by both the federal government and the State of California, produced no evidence of their occurrence in the project area. An adult tortoise observed and photographed by a local resident was likely an escaped captive. However, following direction from the California Department of Fish and Game in informal consultation, because there is a chance that an escaped captive tortoise could be within the project area, before construction the contractor shall furnish a qualified biologist who will be responsible for overseeing compliance with protective stipulations for the desert tortoise. Habitat acquired as mitigation for loss of Mohave ground squirrel habitat would also benefit the desert tortoise.

Swainson's hawk (*Buteo swainsoni*), listed as threatened by the State of California, does not nest in but sporadically does nest near the project area; the closest known nesting location is approximately one km (0.6 mi) east of the southern end of the project area. Alternative 1 would remove 35 planted trees in the community of Olancha, both Fremont cottonwood and black locust, that possibly could be used for nesting by Swainson's hawks. Because potential nesting trees in the area are rare, if Alternative 1 is selected, cottonwood trees removed will be replaced at a 2:1 ratio. Plantings will occur as close to the project area as possible.

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1. Introduction

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) are proposing a new four-lane highway in Inyo County, on Highway 395 near the towns of Olancha and Cartago. The project extends from the existing four-lane highway segment just south of the Los Angeles Aqueduct Bridge No. 48-10 at KP 49.5 (PM 30.8) north to the four-lane segment at the Ash Creek Bridge No. 48-11 KP 67.4 (PM 41.9). The project is approximately 17.9 km (11.1 mi) long. The District Transportation Planning Branch initiated this project with support from the Inyo County Local Transportation Commission (LTC). The proposed project will upgrade the existing two-lane conventional highway to a four-lane expressway, or partial conventional four-lane highway, which will improve the Level of Service (LOS), ease congestion, and improve the overall safety of the highway in the area. There are six alternatives proposed: five build alternatives and one no-action.

1.1. Project History

1.1.1. Background

This project is listed in the 2001 Inyo County Regional Transportation Plan, as is the need to four-lane the rest of Route 395 in Inyo County. The plan states that “The Local Transportation Commission concurs with these System Planning concepts and reaffirms its recommendations that the Route 14/395 be recognized as being of statewide significance and that the major portions of these two routes be upgraded to four lanes.” The route concept, as described in the U.S. 395 Transportation Concept Report (TCR, dated May 2000), is to improve U.S. Highway 395 in Inyo County to a four-lane, controlled access highway with a level of service of “C” or better. U.S. Highway 395 is recognized by the District System Management Plan as one of the two major transportation corridors in the District. The focus of the District System Management Plan is to “continue upgrading U.S. Highway 395 corridor to a four-lane facility” from the Los Angeles and San Bernardino county lines to Lee Vining in Mono County. With the completion of the proposed Black Rock, Independence, Manzanar, and Olancha/Cartago Four-Lane projects, a continuous four-lane expressway will occur from the Kern/Inyo County line to the end of the completed Rush Creek 4-Lane project at KP 82.6 (PM 51.3) in Mono County.

U.S. 395 is a high-emphasis route in the Inter-Regional Road System. It is a major element of a transportation corridor connecting the Eastern Sierra Region (Inyo and Mono counties) and Western Central Nevada to the Southern California region (Figure 1). As a

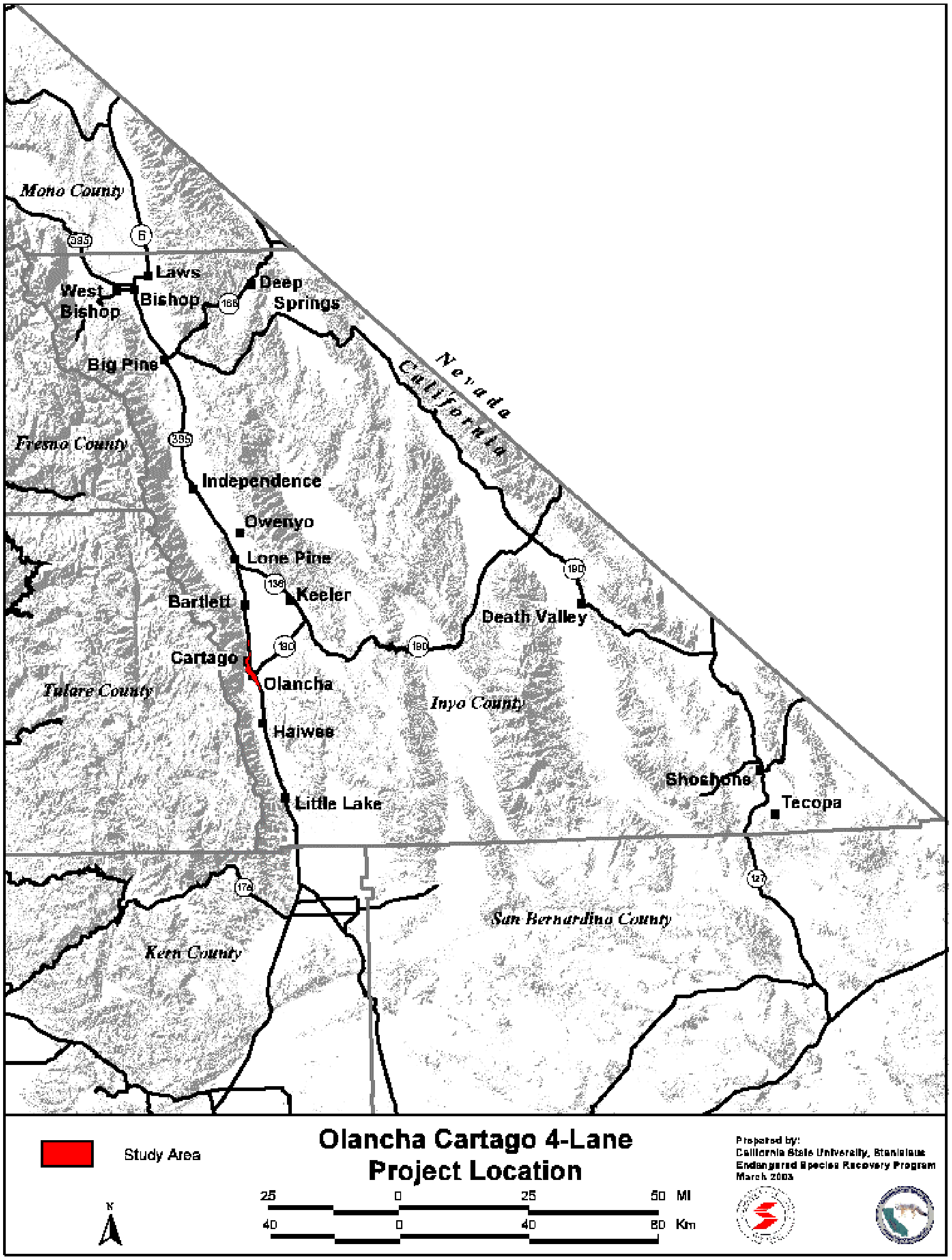

Figure 1. Location of the Olancha/Cartago Four-lane project.

transportation corridor it serves several purposes. First, it is vital to the economy of the Eastern Sierra region for the shipment of goods and materials. The region imports virtually all of its food, clothing and other goods. Secondly, this corridor has major recreational use as evidenced by over seven million visitor-days of recreation generated annually in the Eastern High Sierra. An Origination and Destination Travel Study conducted in 2000 for Route 395 through Inyo and Mono counties indicated that 68% of the non-commercial traffic was recreationally oriented and was composed of 4.3% recreational vehicles. It also indicated that 36% of all vehicles coming into the Eastern Sierra Region originated from Southern California, with average personal vehicle occupancy of 2.5 persons.

The Inyo and Mono County Local Transportation Commissions, Caltrans, the City of Bishop, and the Town of Mammoth Lakes recognize the importance that U.S. Highway 395 has for the tourist trade in the region and strongly support this improvement. A coalition of Regional Transportation Planning Agencies (RTPAs) consisting of Inyo County Local Transportation Commission, Mono County Local Transportation Commission, and Kern Council of Governments was formed with the prospect of jointly funding this and other projects.

This project was submitted during the 1998 State Transportation Improvement Program. The proposed project would improve the level of service of the existing facility, provide increased capacity to meet present and future traffic demands, and ease peak traffic congestion and queuing by expanding the existing highway to a four-lane expressway. The proposed project would:

- Remove passing restrictions,
- Separate opposing traffic,
- Provide adequate shoulder widths for disabled vehicles and bicycle traffic,
- Provide for emergency parking areas,
- Improve drainage, and
- Improve route continuity.

The proposed project would address all deficiencies of the existing facility. All features would meet current standards for a design speed of 130 kph (80 mph).

A pavement deflection study conducted in March and April of 1998 revealed that the existing pavement needs corrective measures. Pavement condition has deteriorated throughout the majority of the proposed project limits, with continuous transverse cracking and segments of severe alligator “B” cracking.

With the construction of the Olancha/Cartago Four-lane, the goal of four lanes for U.S. Highway 395 in Inyo County will be met. The completion of this four-lane facility will bring the level of service up to A for the 20-year planning period. Without improvement, this segment will deteriorate to LOS E by 2010. Construction of the project would bring this segment of U.S. 395 to current expressway standards, improve route continuity, and meet the route concept for Inyo County.

1.2. Project Description

The project is located in Inyo County, on Highway 395 near the towns of Olancha and Cartago (Figure 1). The southern end of the project is just south of the Los Angeles Aqueduct Bridge No. 48-10 at KP 49.6 (PM 30.8). The project extends north to the existing four-lane segment at the Ash Creek Bridge No. 48-11 at KP 67.4 (PM 41.9). The project is approximately 17.9 km (11.1 mi) long. The alternatives propose include five build alternatives and one no-action alternative (Figure 2, Table 2, Appendix A).

1.2.1. Actions Common to Alternatives 1, 2, 2a, 3, and 3a

- Construct two or four new travel lanes, depending on alternative, with a median separating direction of travel, and outside shoulder widths of 3 m (10 ft).
- A median width varying from 24.4 m (80 ft) to 30.5 m (100 ft) for expressway segments of build alternatives (the median width of alternative 1 is 3.5 m (14 ft) paved)
- Rehabilitate and bring the existing traveled way up to standard
- Construct right- and left-turn lanes where necessary or required by design standards
- Correct road connections, bringing them up to current Caltrans Standards
- Improve drainage
- A new bridge (#48-0010) will cross the Los Angeles Aqueduct to the west of the existing bridge (#48-10), located to provide a 30-m (100-ft) median. Proposed bridge location is at approximately KP 50.3 (PM 31.3)
- Direct access and/or frontage roads will be provided for any land-locked properties.

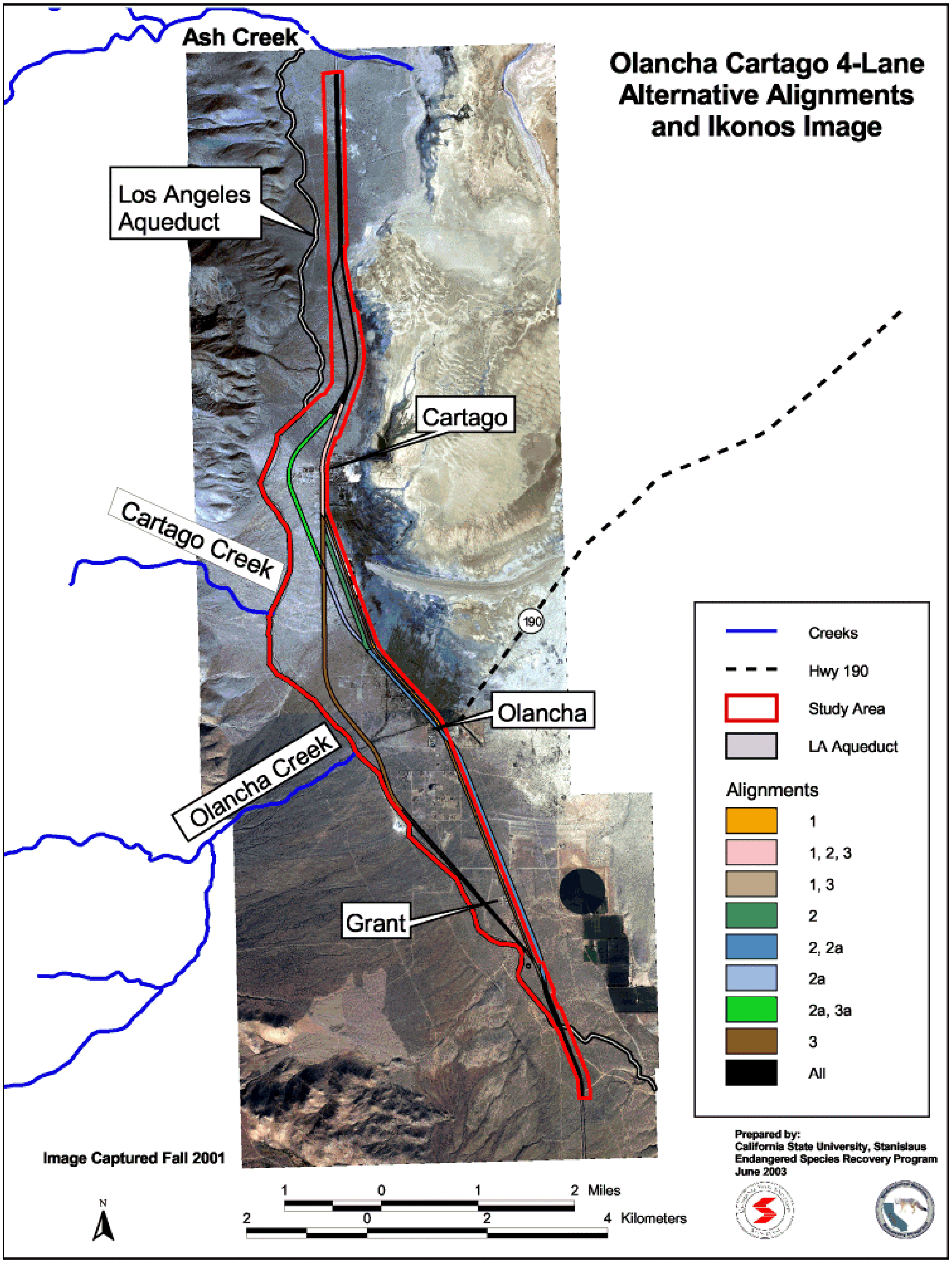

Figure 2. Project study area and proposed alignments.

Table 2. Summary of effects on plant communities, developed areas, and planted trees by build alternative.

	Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Alternative 3a
Vegetation Series	**Area within right-of-way in ha (ac)**				
Big Sagebrush	1.4 (3.5)	9.9 (24.3)	10.3 (25.4)	13.4 (33.1)	13.4 (33.1)
Bulrush	0	0	0	0	0
Creosote Bush	3.8 (9.5)	0	4.6 (11.3)	4.6 (11.3)	4.6 (11.3)
Fremont Cottonwood	0.1 (0.3)	0.8 (1.9)	1.0 (2.5)	1.0 (2.5)	1.3 (3.2)
Greasewood	0.2 (0.6)	0	0	0	0
Mixed Saltbush	0	0	0	2.8 (7.0)	2.8 (7.0)
Mixed Willow	0	0	0	0	0
Rubber Rabbitbrush	0	4.3 (10.7)	4.3 (10.7)	0	0
Saltgrass	0	0	0	0	0
Shadscale	6.2 (15.4)	43.3 (107.0)	52.6 (130.0)	33.7 (83.4)	42.8 (105.9)
Total natural	11.8 (29.3)	58.2 (143.9)	72.8 (180.0)	55.6 (137.4)	65.0 (160.6)
Other	**Area within right-of-way in ha (ac)**				
Alfalfa field	0.04 (0.09)	0.2 (0.5)	0.2 (0.5)	0	0
Urban	0.6 (1.4)	3.9 (9.6)	3.7 (9.1)	2.6 (6.5)	2.5 (6.2)
Number of individuals in right-of-way					
Planted trees*	35	0	0	0	0

- *** Planted trees include Fremont cottonwood (*Populus fremontii*) and black locust (*Robinia pseudoacacia*).**

1.2.2. Alternative 1

This alternative would widen the existing highway to four lanes, with characteristics of both a controlled access expressway and a rural conventional highway (Figure 2, Table 2, Appendix A).

- From KP 49.6 (PM 30.8) to approximately KP 51.7 (PM 32.1), the proposed alignment would have controlled access with a 30.5-m (100-ft) unpaved median and 3-m (10-ft) outside paved shoulders. New northbound lanes would be constructed east of the existing highway, which would be used for southbound traffic.

Alternative 1 would affect approximately 11.78 ha (29.3 ac) of natural communities, as well as small amounts of human-modified landscapes (alfalfa field and urban area) and 35 large, planted shade trees in Olancha (Table 2). These effects are calculated from one new right-of-way fence to the other new right-of-way fence.

1.2.3.` Alternative 2

This alternative is a four-lane, divided, controlled access expressway with an unpaved median varying in width from 24.4 m (80 ft) to 30.5 m (100 ft) (Figure 2, Table 2, Appendix A).

- This alternative would utilize the existing highway from KP 49.6 (PM 30.8) to KP 50.9 (31.6) for northbound traffic, and new southbound lanes would be constructed west of the existing lanes.
- From KP 50.9 (PM 31.6) to KP 60.0 (PM 37.3), new north and southbound lanes would be constructed to expressway standards. The new lanes would be constructed east of the existing alignment from KP 50.9 (31.6) to just south of the Rte 190 junction, KP 55.8 (PM 34.7). The existing highway would be utilized as a new frontage road and would be relinquished to Inyo County.
- From KP 55.8 (PM 34.7) to KP 60.0 (PM 37.3), the median width is 24.4 m (80 ft).
- Just south of the Rte 190 junction, the new alignment would transition over and be built
- From approximately KP 60.0 (PM 37.3) to approximately KP 61.8 (PM 38.4), the proposed alignment would have controlled access with a 30.5-m (100-ft) unpaved median and 3-m (10-ft) outside paved shoulders. New southbound lanes would be constructed west of the existing highway, which would be used for northbound lanes.

- From approximately KP 61.8 (PM 38.4) to approximately KP 64.0 (PM 39.8), the proposed alignment would have controlled access with the southbound lanes split from the northbound lanes, 3-m (10-ft) outside paved shoulders, and 1.5-m (5-ft) inside paved shoulders. An approximately 204-m (670-ft) centerline separation would split the alignments in an effort to avoid utility and wetland effects. New southbound lanes would be constructed west of the existing highway, which would be used for northbound lanes.
- From approximately KP 64.0 (PM 39.8) to KP 66.9 (PM 41.6), the proposed alignment would have controlled access with a 30.5-m (100-ft) unpaved median and 3-m (10-ft) outside paved shoulders. New northbound lanes would be constructed east of the existing highway, which would be used for southbound lanes.

Alternative 2 would affect approximately 58.2 ha (143.9 ac) of natural communities, as well as 0.2 ha (0.5 ac) of alfalfa field and 3.9 ha (9.6 ac) of urban area (Table 2). These effects are calculated from one new right-of-way fence to the other new right-of-way fence.

1.2.4. Alternative 2a

Alternative 2a is identical to Alternative 2 in terms of the type of facility that is being proposed. Alternative 2 passes through Cartago, however, and Alternative 2a bypasses Cartago to the west following an existing railroad grade (Figure2, Appendix A).

- Alternative 2a is identical to Alternative 2 until it reaches KP 57.9 (PM 36). At approximately KP 57.9 (PM 36), instead of the new alignment paralleling the existing highway, it would transition to the west to meet an existing railroad grade and would continue around Cartago. The new alignment would continue west of Cartago and transition back to the existing alignment near KP 61.9 (PM 38.5). From this point north, Alternative 2a is identical to Alternative 2.

Alternative 2a would affect approximately 72.8 ha (180.0 ac) of natural communities, as well as 0.2 ha (0.5 ac) of alfalfa field and 3.7 ha (9.1 ac) of urban area (Table 2). These effects are calculated from one new right-of-way fence to the other new right-of-way fence.

1.2.5. Alternative 3

Alternative 3 comprises a four-lane divided expressway west of the existing U.S. Highway 395 corridor (Figure 2, Appendix A), bypassing the community of Olancha to the west. This alternative would utilize the existing highway from KP 49.6 to KP 50.9 (PM 30.8 to PM 31.6) for southbound traffic and new northbound lanes would be constructed east of the existing lanes. From KP 50.9 (PM 31.6) new north and southbound lanes would be constructed generally paralleling the Los Angeles Aqueduct for approximately 9.5 km (5.9

mi) and then heading due north to intersect with the existing alignment in Cartago at KP 60.0 (PM 37.3). From Cartago north, Alternative 3 is identical to Alternative 2.

With this alternative, it is desirable to extend State Route 190, a rural conventional highway, approximately 1.3 km (0.8 mi) to the west to join the new alignment. This would allow the relinquishment of the existing U.S. 395 highway between KP 50.9 to KP 60.0 (PM 31.6 to PM 37.3) to the County of Inyo.

Alternative 3 would affect approximately 55.6 ha (137.4 ac) of natural communities, as well as 2.6 ha (6.5 ac) of urban area (Table 2). These effects are calculated from one new right-of-way fence to the other new right-of-way fence.

1.2.6. Alternative 3a

Alternative 3a is identical to Alternative 3 except it does not intersect with the existing alignment in Cartago at KP 60.0 (PM 37.3) (Figure 2, Appendix A). Like Alternative 2a, Alternative 3a bypasses Cartago by following an existing railroad grade around and west of Cartago. It would transition back to the existing highway alignment at the same location depicted in Alternative 2a north of Cartago, near KP 61.9 (PM 38.5). From this point north, Alternative 3a would be identical to Alternative 3.

Alternative 3a would affect approximately 65.0 ha (160.6 ac) of natural communities, as well as 2.5 ha (6.2 ac) of urban area (Table 2). These effects are calculated from one new right-of-way fence to the other new right-of-way fence.

1.2.7. Alternative 4

"No Build."

This alternative will have no permanent or temporary effects on vegetation communities or individual plant or animal species.

1.3. Construction

Specific construction methods and order of work are determined by the contractor at the time of contract bidding.

2. Study Methods

In 1999 Caltrans District 9 funded the technical studies for the Olancha/Cartago Four-lane project. At this time specific alternative alignments had not been chosen, so to move forward with the biological studies a study corridor was developed by Caltrans Biologist Wendy Philpott and the project development team (Figure 2). In 2000 Caltrans District 9 awarded a contract to the California State University, Stanislaus, Endangered Species Recovery Projgram (ESRP) to conduct biological survey work for the Olancha/Cartago Four-lane project. Biological survey work started in spring 2001 and ended in fall 2002. The primary tasks of the contract were to:

- Conduct biological surveys within the designated survey corridor,
- Describe the vegetation communities present,
- Determine the occurrence of special-status plant species,
- Determine the occurrence of special-status animal species, and
- Determine if direct, indirect, or cumulative effects to special-status species will occur as a result of implementing the project.

The southern end of the project is just south of the Los Angeles Aqueduct Bridge No. 48-10 at KP 49.6 (PM 30.8) (Figure 2). The project extends north to the existing four-lane segment at the Ash Creek Bridge No. 48-11 at KP 67.4 (PM 41.9). The western border was the Los Angeles Aqueduct, and the eastern border was 61 m (200 ft) east of the existing alignment. The project is approximately 17.9 km (11.1 mi) long.

Final alternative description and mapping was provided by Caltrans Design Engineer Malissa Reynolds in September 2002.

The compensatory mitigation included in this document was developed as a result of project development team meetings and Caltrans Biologist Wendy Philpott conducting informal consultation with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG).

2.1. Studies Required

The following resources were used to develop the list of special-status plant and wildlife species and plant communities that could potentially occur within the survey area and to identify appropriate survey protocols for use in conducting biological surveys:

- The U.S. Fish and Wildlife Service Species List, in a letter dated June 18, 2002, from Diane K. Noda, Field Supervisor, USFWS, Ventura, CA to Wendy Philpott (see Appendix F).
- California Natural Diversity Database (CNDDB) search of all topographic quadrangles in which the project is located (Bartlett, Haiwee Reservoirs, Olancha, and Vermillion Canyon 7.5' quadrangles) as well as adjacent quadrangles (Centennial Canyon, Haiwee Pass, Keeler, Lone Pine, Owens Lake, and Upper Centennial Flat 7.5' quadrangles),
- *A Checklist of the Flora of Owens Valley* (DeDecker 1974)
- *Biological Survey of the Western Water Company Olancha Project Area, Inyo County, California* (Bagley and Leatherman 1999).
- *California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik 1994, Tibor 2001).
- Personal Communication with agencies, such as the CDFG and the Bureau of Land Management (BLM).

The botanical surveys were designed to maximize the potential for observing sensitive plants by timing the surveys to coincide with peak flowering periods of plants that had the potential to occur in the area. According to agency guidelines (USFWS 1996a, CDFG 2000a, Tibor 2001), all plants observed were identified to the level necessary to determine whether they might be rare. Vegetation communities with the highest potential for target species were surveyed on at least three occasions to allow for variations in phenology. To familiarize observers with characteristics of target plant species, herbarium specimens were studied at the University of California, Berkeley, and California State University, Fresno, prior to the survey. Known locations for target species within the study area were also visited repeatedly to observe their phenological stage. Rare plant locations were mapped using Garmin™ III GPS units.

The Highway 395 study area was surveyed systematically for plants by walking meandering transects at approximately 30-m (100-ft) intervals. Intervals were reduced to approximately 15 m (50 ft) when the diversity of the vegetation was high, or when density of the vegetation reduced visibility. Observers maintained relatively straight transects by using compasses and by sighting on markers placed at appropriate intervals. However, meandering within the transects was necessary to observe any unusual plants or microhabitats. Individual transects were mapped using Garmin™ III GPS units with an estimated accuracy of no less than 10 m (33 ft). A map of the transects is available from the Caltrans office in Bishop; it is too complicated to include in this document. All plant species seen were identified on site or later in the laboratory using Munz and Keck (1968) or Hickman (1993). Species identifications were later compared with lists of species occurring in the Owens Valley (DeDecker 1974, Clifton no date) and the Mohave desert (Baldwin et al. 2002). Scientific names used in this report follow Baldwin et al. (2002).

Vegetation communities were described to the series level, photographed, and delineated on a map. The component series were identified by the presence and abundance of dominant species according to A Manual of California Vegetation (Sawyer and Keeler-Wolf 1995), in compliance with Memorandum of Understanding Number 22 between Caltrans and the Trustees of the California State University.

2.1.1. Wetlands Delineation

In 2000 Wendy Philpott, Caltrans District 9 Biologist, conducted wetland delineations in the Willow Dip area and in the wetlands east of the existing 395 alignment from the 395/190 junction north to the Cabin Bar Ranch. Because the boundary of the wetland within the Willow Dip area was not easily visible, it was identified with a GPS unit. The wetland habitat to the east was obvious and so the existing right-of-way fence was used as the delineation line. This information was given to the Caltrans design engineer and all the proposed project build alternatives were designed to not affect any wetland. Because no wetland will be affected by the project a wetland assessment was not prepared for this project.

Wetland delineations by Wendy Philpott in 2000 were done using the U.S. Army Corps of Engineers (ACOE) method to identify wetlands under Section 404 jurisdiction (Environmental Laboratory 1987). Wetlands are defined in 33 CFR 328.3(b) as “areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions.” In the absence of human disturbances or unusual circumstances, an area must contain three diagnostic characteristics to be considered a jurisdictional wetland, including the presence of: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology.

Hydrophytic Vegetation - Hydrophytic vegetation dominates areas where the frequency and duration of inundation or soil saturation exerts a controlling influence on the plant species present. Plant species are assigned wetland indicator status according to the probability of species occurring in wetlands (Reed 1988). More than 50 percent of the dominant species must be hydrophytic to meet the hydrophytic vegetation criterion.

Hydric Soils - Hydric soils are saturated or ponded for a sufficient duration during the growing season to develop anaerobic or reducing conditions that favor the growth and regeneration of hydrophytic vegetation (Environmental Laboratory 1987). Indicators of wetlands soils include observations of ponding or saturation, dark (low chroma) soil colors, bright mottles (concentrations of oxidized minerals such as iron), or gleying, which indicates reducing conditions by a blue-grey color. Additional supporting information includes documentation of a soil as hydric, or reference to wet conditions in the county soil survey. Often, localized hydric soil conditions are not documented because of their small size, erroneous mapping, or recent development of hydric conditions.

Wetland Hydrology - Wetland hydrology is inundation or soil saturation with a frequency and duration long enough to cause the development of hydric soils and plant communities dominated by hydrophytic vegetation. Assessment of wetland hydrology is frequently supported based on obvious topographic patterns of drainage and impoundment.

2.1.2. Wildlife Surveys

Focused surveys were conducted for Mohave ground squirrels, desert tortoises, Swainson's hawks, bats, and nocturnal small mammals. In addition ESRP staff kept lists of all vertebrate species observed while in the field.

2.1.2.1. Focused Surveys for Mohave Ground Squirrels

A two-day reconnaissance of the survey area was performed on January 27-28, 2001. This comprised a visual assessment of habitat on undeveloped lands within 1.6 km (1 mi) of the existing alignment of U.S. Highway 395 between the Los Angeles Aqueduct Bridge No. 48-10 and the Ash Creek Bridge No. 48-11, a distance of approximately 17 km (10.5 m). This area was evaluated for its potential as Mohave ground squirrel habitat based on vegetation, soils, and slope. The reconnaissance indicated that habitat apparently suitable for the Mohave ground squirrel existed on undeveloped lands in those portions of the project area west of the current alignment of U.S. Highway 395. Much of this area is characterized by deep, fine-grained alluvial soils that provide a good substrate for rodent burrows. The vegetation is typical of that found in many areas of the western Mohave desert where Mohave ground squirrels have been reported. Saltbush species, such as shadscale (*Atriplex confertifolia*) and allscale (*A. polycarpa*), and creosote bush (*Larrea tridentata*) dominate the shrub community in the project area west of U.S. Highway 395. Shrub species richness is high throughout much of this area, with 15 to 19 shrub species noted at a number of sites. The shrub community includes winterfat (*Krascheninnikovia lanata*) and spiny hopsage (*Grayia spinosa*), two species known to be preferred forage plants for Mohave ground squirrels (Leitner and Leitner 1998). Shrub cover appears to be relatively high over most of the area as well, with estimated cover values often in the range of 15-20 percent. These site characteristics are often associated with the presence of the Mohave ground squirrel.

Based on this reconnaissance, 10 sites were selected for trapping based upon habitat suitability, access, lack of development or human disturbance, and distribution throughout the length of the project area (Figure 3). These sites were on undeveloped lands to the west of the existing U.S. Highway 395 alignment. Trapping grids were placed about 1.6 km (1 mi) apart and were selected to include all suitable habitats present within the study area. They occurred on lands owned by BLM and LADWP (Los Angeles Department of Water and Power), and on private parcels whose owners had given written permission for access. All sites supported desert shrub communities that appeared to provide suitable habitat for the Mohave ground squirrel.

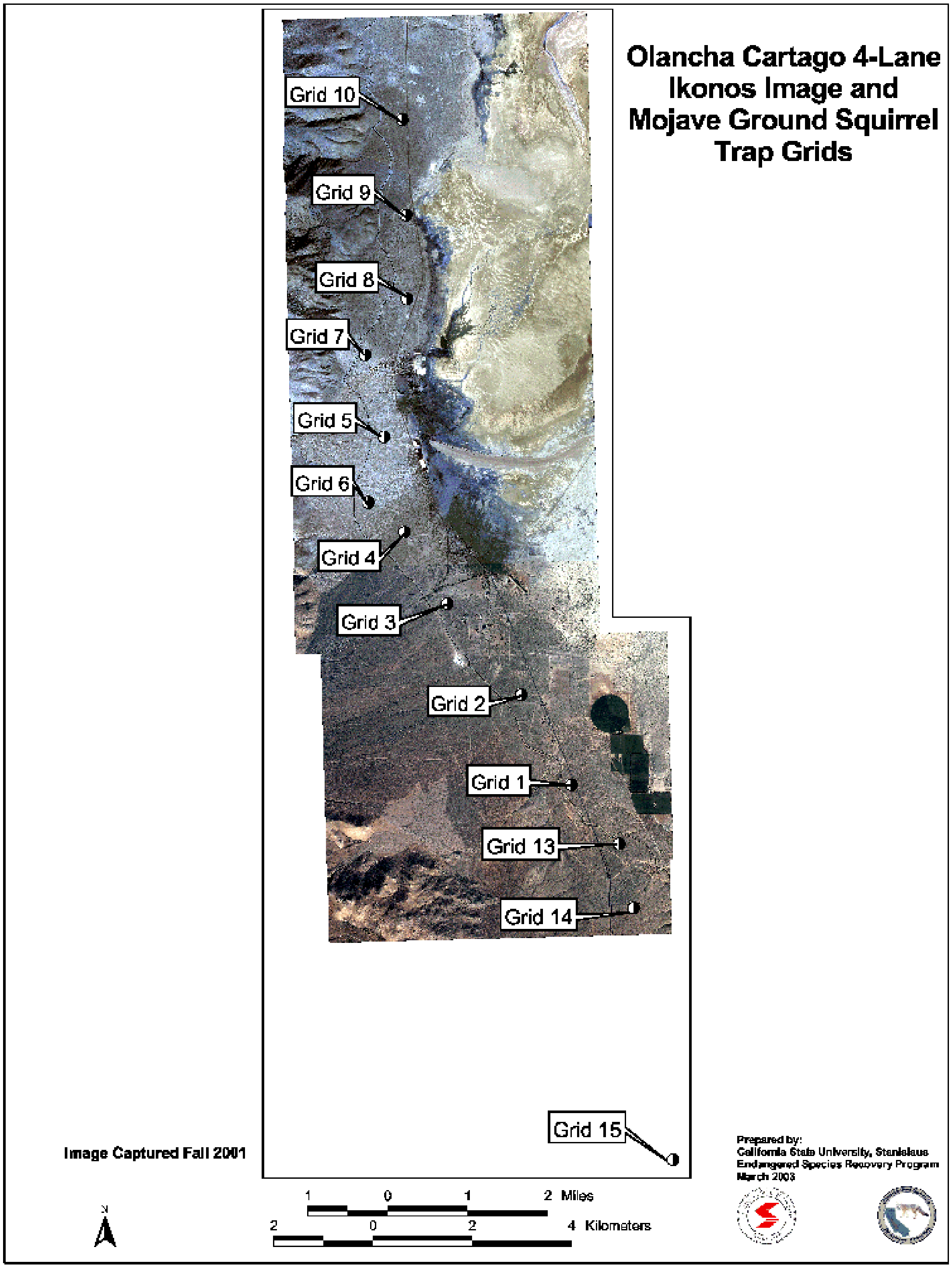

Figure 3. Locations of Mohave ground squirrel trap grids.

During 2002, based on the apparent absence of Mohave ground squirrels after negative trapping results in the study area during 2001 and after consultations with CDFG, Caltrans decided to extend the trapping efforts to the south, well out of the project area. This was an attempt to establish the location of the nearest Mohave ground squirrel population. Reconnaissance surveys were conducted from the Los Angeles Aqueduct Bridge No. 48-10, the southern end of the Olancha/Cartago study area, to Coso Junction, a distance of about 25 km (15 mi). Based on soils, vegetation, and topography as described above, we identified three areas between the Los Angeles Aqueduct Bridge No. 48-10 and Coso Junction east of Hwy. 395 and west of Haiwee Reservoir in which to locate trap grids (Figure 3).

The trapping grids comprised 100 trap stations arranged in four parallel lines of 25 stations each, with traps and traplines separated by 25 m (82 ft) in 2001 and 35 m (115 ft) in 2002. Field personnel set up each grid by pacing all distances and placing a wire flag at each trap station. A single Pymatuning, Sherman, or Tomahawk live trap was positioned near each trap station. During the April trapping sessions, all traps were placed under shrubs to provide shade. In May, cardboard covers were placed over traps. In 2001, each grid formed a rectangle measuring 75 x 600 m (246 x 1969 ft), with an area of 4.5 ha (11.1 ac). In 2002, each grid formed a rectangle of 105 x 850 m (2789 ft). The area actually sampled by each grid included a boundary strip around the outer trap stations. Mohave ground squirrels normally move at least 50 m (164 ft) during daily foraging activities, so that animals with home-range centers up to 50 m (164 ft) from the outer edges of the grid could encounter the traps. Thus, if a boundary strip of 50 m (164 ft) is assumed, each grid effectively sampled an area of about 12.2 ha (30 ac) in 2001 and 19.5 ha (48.1 ac) in 2002.

Traps were baited with a commercially available horse feed made up of a mixture of grains (oats, corn, wheat, and barley) coated with molasses, to which a powdered mixture of rolled oats and peanut butter was added. All ground squirrels captured were identified to species. When captured, Mohave ground squirrels and white-tailed antelope squirrels (*Ammospermophilus leucurus*) were marked on the belly with a red marking pen when possible, so that the number of individuals captured could be specified. They were examined for sex, age, and reproductive condition and then released at the point of capture. During both the April and May sampling periods, trapping was carried out for five consecutive days on each of 10 trapping grids. In 2001, field personnel trapped on grids 1 through 10 (Figure 3). During the first trapping session in 2002, trapping occurred on grids 1-4, 6, 7, 10, and three grids south of the study area, numbered 13, 14, and 15. During the second trapping session in 2002, we trapped on grids 1-10. Traps were opened in the morning between 0745 and 0945 hours and closed in the afternoon between 1600 and 1800 hours.

Weather conditions monitored during the sampling periods were generally favorable for this type of field survey. Daily high temperatures in April were generally 16°-19°C (60°-67°F), skies were clear to partly overcast, and winds on ranged from zero to about 5 m/sec (10 knots). A storm on April 9, 2001, reduced daily high temperatures to 10°-13°C (51°-55°F) and produced occasional snow flurries. On four days, wind speeds up to 10-12 m/sec (20-25 knots) were recorded, although these velocities were not sustained for more than a few hours. During May, weather conditions were also generally good. Daily maximum temperatures ranged from 27°-36°C (80°-97°F), skies were clear to partly overcast, and wind velocities ranged from zero to about 5 ms/sec (10 knots). On May 12, 2001, a storm resulted in a daily high of 22°C (72°F) and completely overcast skies with occasional light rain.

2.1.2.2. Focused Surveys for Desert Tortoises

Surveys for desert tortoise were conducted using the USFWS Field Survey Protocol for any Federal Action That May Occur within the Range of the Desert Tortoise (U.S. Department of the Interior (USDI) USFWS 1992) and consisted of walking 100% of the project site, using adjacent, 7.6-m (30-ft) wide transects. "Zone-of-influence" transects were planned, but as explained below, were not conducted. Surveys were conducted on June 20, 21, and 22, 2001, to take advantage of maximum annual sign accumulation. This protocol was approved by the USFWS (G. Walker, USFWS Barstow Field Office, pers. comm. to A. Karl, March 14, 2001).

Upon meeting the morning of June 20, we determined that the survey area would be substantially reduced due to limited private property access. Those properties with permitted access were surveyed using 100% cover transects (Figure 4). No Zone-of-influence transects were walked due to access constraints. On all surveys, tortoise surveyors were instructed to record and describe (e.g., size, age, gender associations) all tortoise sign (e.g., individuals, dens, burrows, scat, tracks, pellets, skeletal remains). The survey area was described relative to topography, drainage type, soils, substrate, aspect-dominant, common and occasional plant species, plant cover (estimated visually), and anthropogenic disturbances.

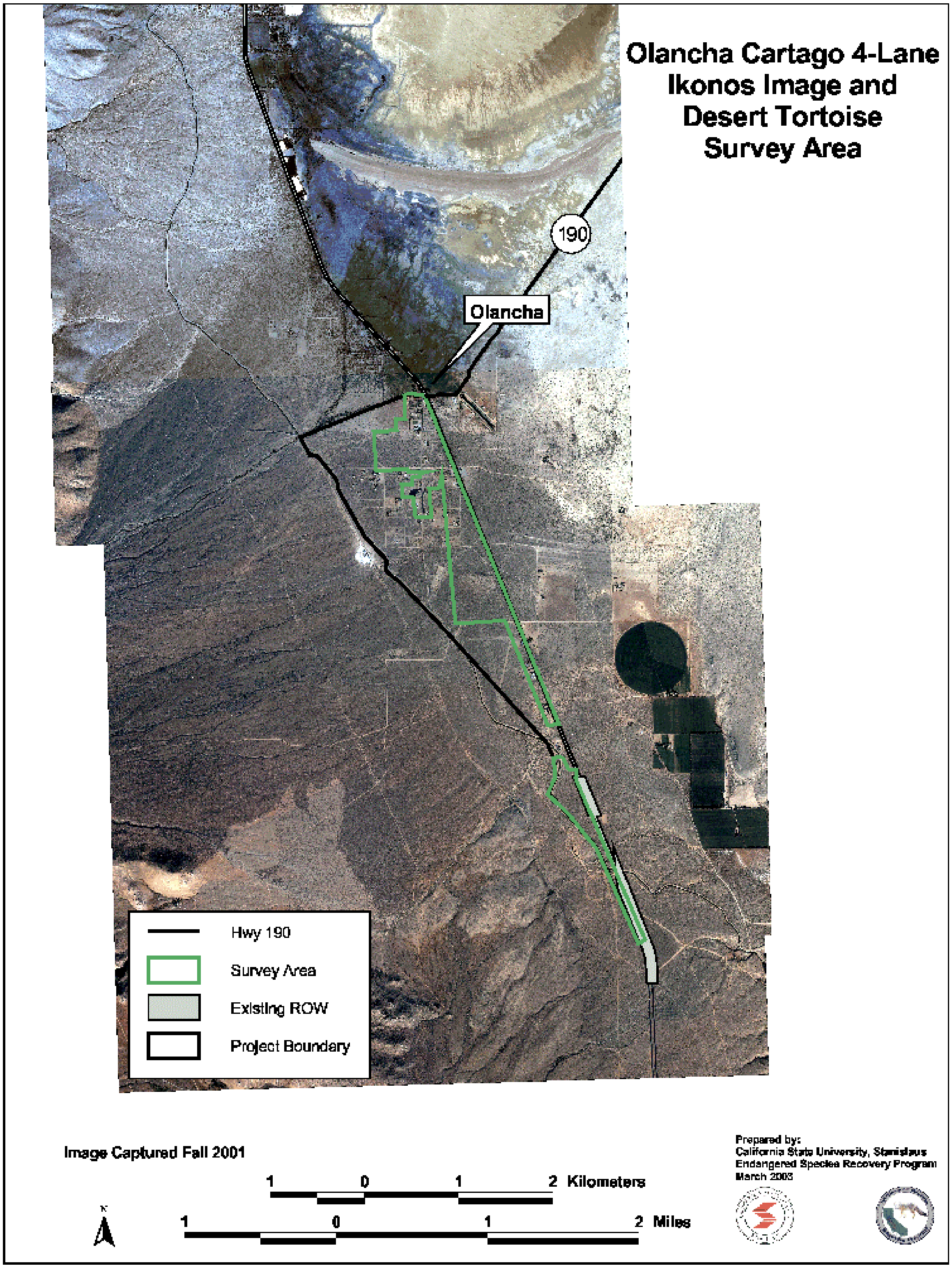

Figure 4. Areas surveyed for desert tortoise.

2.1.2.3. Focused Surveys for Swainson's Hawks

There are no published protocols for conducting surveys for Swainson's hawks. However, we did obtain survey recommendations from CDFG (Ron Schlorff pers. comm.) and the Swainson's hawk Technical Advisory Committee (Michael Bradbury pers. comm.). It was recommended that surveys be conducted from mid-March to mid-April to detect staging pairs. Swainson's hawks rarely establish a nest after this period, and they exhibit great fidelity to nest sites. Morning surveys are preferred (sunrise to 2 hr after sunrise), although evening surveys (1 hr before sundown until dark) may be successful because Swainson's hawks are likely to be sitting in their staging trees at those times. Surveys during mid-day are less successful because Swainson's hawks typically soar high and far from nest sites. Surveys conducted after mid-April are generally not productive because tree foliage tends to obscure nests and perching hawks, and because females become rather silent after laying eggs and while brooding. Males are often inconspicuous when returning to the nest with food.

On 18 and 24 March 2001, before the trees had leafed out, from 0630 to 0930 and 1600-1800, we examined the study area from a vehicle and on foot for stick nests in trees, and for Swainson's hawks and other raptors present. We also watched for raptors during other fieldwork (e.g., Mohave ground squirrel trapping, desert tortoise surveys) in the area during April, May, and June.

2.1.2.4. Focused surveys for bats

Our investigation focused on determining the species of bats present within the study area and evaluating potential roost sites for evidence of use by bats. We conducted a search of the literature for records of occurrence of bats around Owens Lake, assuming that this would provide a comprehensive list of bats likely to use or pass through the area. We acoustically monitored bats in the field using the Anabat II system to detect and record ultrasonic vocalizations. Calls were recorded directly to a laptop computer running Anabat6 software for MS-DOS (O'Farrell et al. 1999, Corbin 2000*a*). Sequences of vocalization up to 15 sec in duration were recorded in a single file in real-time with the Anabat system. A file's content included from one to several discrete calls of one or more individuals and species. In reporting relative activity of bats, each file was enumerated. Several sequential files might represent the vocalizations of a single bat foraging back and forth within the range of the bat detection equipment, but no attempt was made to combine "single passes" from sequential files. A file was scored only once for a species even when there appeared to be two or more bats of that species calling at the same time. Where vocalizations of two bat species were recorded in the same file, both species were tallied. Call files per minute were calculated beginning with the first and last bat call recorded during the session. This value provides a very rough index to relative activity during the recording period.

Recorded vocalizations were visually inspected (O'Farrell et al. 1999) using the Analook software (version 4.8fe, Corbin 2000*b*) and compared to libraries of recorded vocalizations of known bats (ESRP unpubl. data; Gannon 2003). Many recorded vocalizations were either too short or otherwise unidentifiable to species. Sometimes when a short call preceded or followed another file with more vocalizations, it was possible to assign a species identification based on the context of the preceding and subsequent vocalization files.

These methods served to enumerate the level of bat activity over time and identify the species present but results should not be interpreted to represent numbers of individuals or absence of rare species that have vocalizations similar to more common species.

We acoustically monitored along Olancha Creek (Figure 5, Bat 1) and Cartago Creek (Figure 5, Bat 3) on 15 May 2001. Monitors were turned on at 1830 and turned off at 2230. There was water in both creeks at that time. The bat detector operated along Cartago Creek was not connected to a recorder. At a concentration of flying bats at the Highway 395 bridge over the Los Angeles Aqueduct (KP 49.5 (PM 30.8)), we recorded bat vocalizations from 2125 to 2137 to determine the species using the underside of the bridge.

We acoustically monitored one site west of and above the study area along Walker Creek (Figure 5, Bat 2) at approximately 1,513 m (4,964 ft) elevation. This is a tributary of Olancha Creek that occurs in topographically and floristically more complex vegetation including big sagebrush (*Artemisia tridentata*), rabbit brush (*Chrysothamnus nauseosus*), interior live oaks (*Quercus wislizenii*), pinyon pine (*Pinus edulis*), ash (*Fraxinus velutina*), alder (*Alnus rhombifolia*), and willows (*Salix* spp.). Monitoring was conducted on 15 and 16 May 2001 between 1820 and 2100. We also acoustically monitored at the edge of a village oasis/alkaline meadow (approximately 1,125 m (3,690 ft) elevation) on the southern outskirts of Lone Pine, north of the study area, on 16-17 May and 8-9 October 2001. On 16-17 May the monitor operated between 1950 and 0108. On 8-9 October the monitor operated all night, between 1600 and 0702. The monitoring activities outside the study area were designed to provide recordings of bat calls to compare with those gathered along Olancha Creek and as a further check on the bats commonly using the Owens Valley.

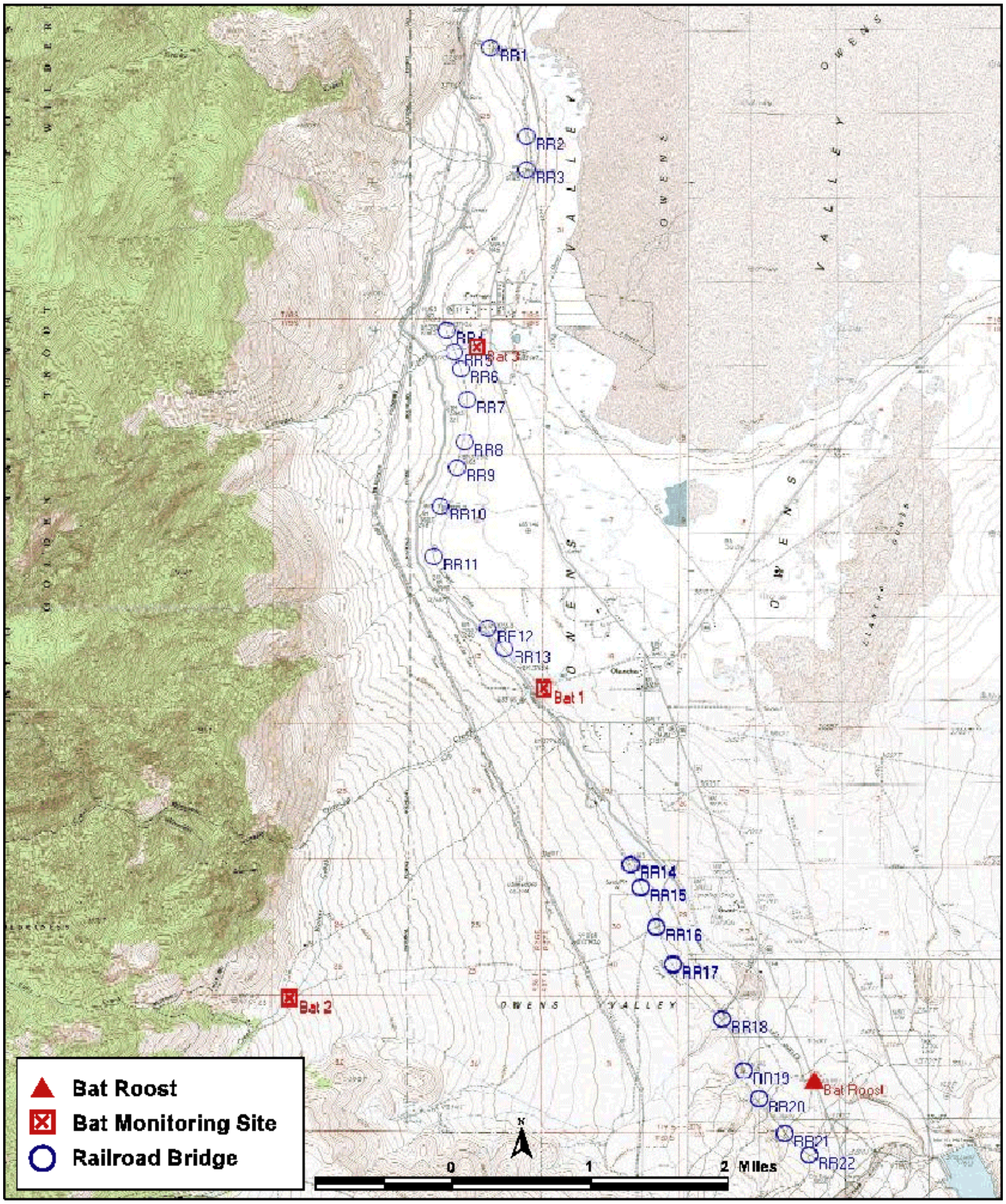

Figure 5. Locations of railroad bridges, bat monitoring sites, and a suspected roost under a bridge on the Los Angeles Aqueduct and U.S. Highway 395.

We searched for roosting bats and evidence of bat roosts at sites located under bridges and culverts of an abandoned railroad running the length of the study area (Figure 5), and at one site in a building within the study area where there was a verbal report by D. Newman, biologist, ESRP, of a roosting bat. The building was located at a cluster of buildings known as Grant (approximately 1,136 m (3,727 ft) elevation); most of the buildings were part of motel complex, and the site of the reported roosting bat was in a pump/storage shed. We did not have permission to check for bat roosts in buildings on other private properties.

2.1.2.5. General surveys for nocturnal terrestrial mammals

Small-mammal trapping lines were established at nine locations along the project area (Figure 6). Areas for trapping were selected to include all major habitat types in the study area. Traps at each location were placed approximately 10 m (3.3 ft) apart near areas of recent small mammal activity such as burrows, diggings, and dust baths to maximize capture success. Each trapline comprised 50 Sherman extended-length live traps. A total of 450 traps were operated nightly for 4 consecutive nights resulting in 1,350 trap nights of effort. Traps were baited with millet seeds, and a paper towel was inserted into each trap. Traps were opened before dusk and checked and closed approximately 2 hr after dark. Each animal captured was identified to species, sexed, and weighed. Age and reproductive condition were also noted. Captured animals were marked on the flank with a black permanent ink marker so that recaptures could be readily identified.

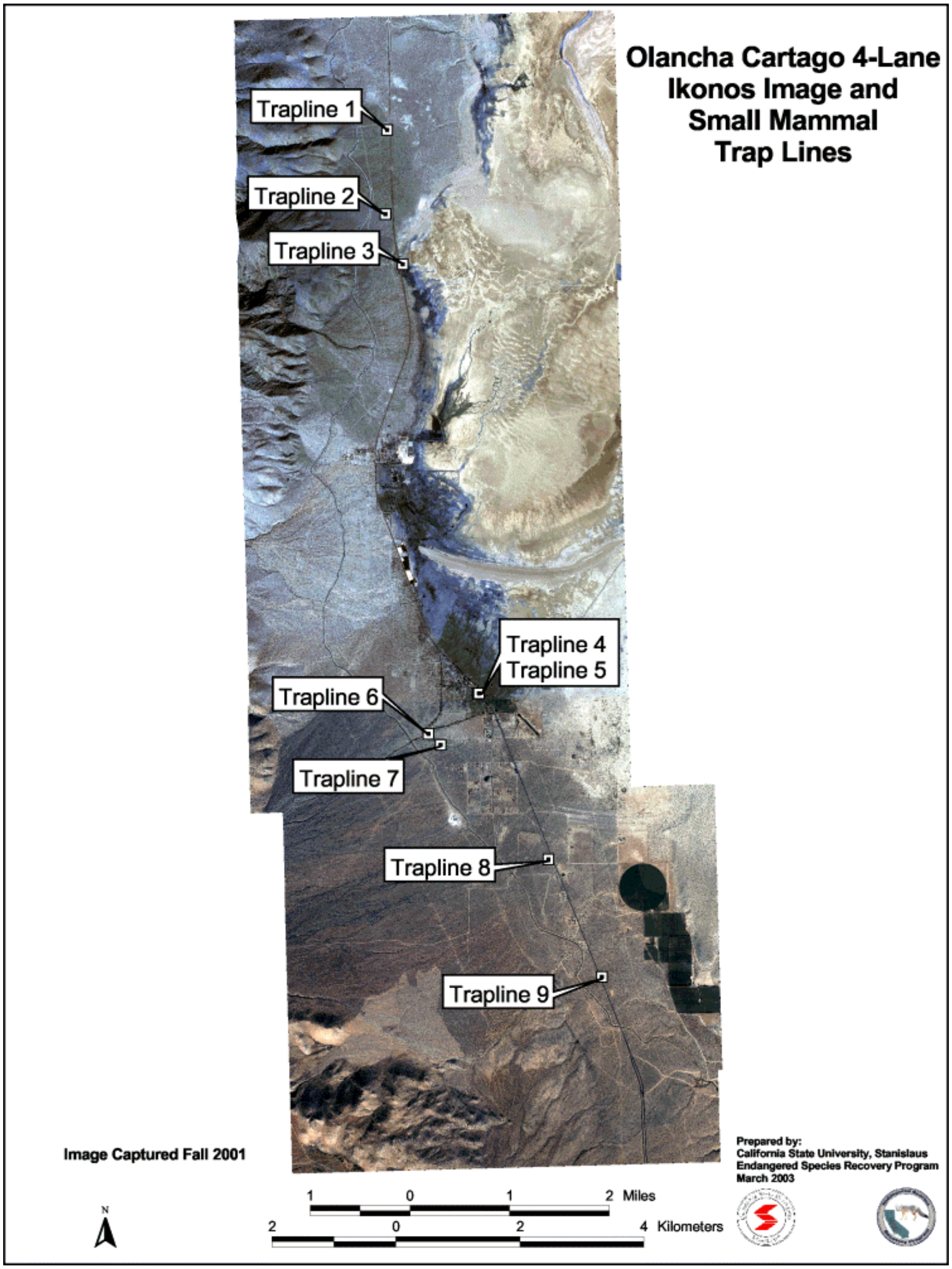

Figure 6. Small mammal trap lines.

2.2. Personnel and Survey Dates -

2.2.1. Wetland

The wetland delineation for the Willow Dip area was conducted on May 15, 2002, and the wetland delineation for the agricultural wetland habitat east of the existing alignment was conducted April 19, 2000.

- Wendy Philpott, Associate Biologist, Caltrans District 9. B.A. Applied Biology, California State University Fresno, 1996. Experience conducting wetland delineation in the Central Valley and desert ranges of California since 1998.

2.2.2. Botanical Surveys

The primary botanical surveys were conducted during April 16-20, April 23-27, and April 30-May 4, 2001. Moist, alkali meadows were surveyed again from June 4-8, 2001. Ellen Cypher, Russell Kokx, and Justine Smith Kokx conducted follow-up surveys in selected habitats on March 1, March 22, April 7, and May 3-4, 2002.

Botanical surveys were coordinated by Ellen Cypher, who prepared the survey protocol and list of target species. Russell Kokx led the plant survey crew. Other staff from ESRP who assisted with the botanical surveys were Karen Dulik, Justine Smith Kokx, and John Silvas. Qualifications of these individuals are listed below.

- Ellen Cypher, Research Ecologist, ESRP. Ph.D. in Plant Biology (major in Plant Ecology and Plant Taxonomy) from Southern Illinois University, 1993. Experience conducting surveys for rare plants in the Central Valley, desert, and coast ranges of California since 1990. Research and recovery plan preparation for endangered and rare California plants since 1992.
- Russell Koxk, part-time Desert Ecologist, ESRP, and part-time environmental consultant. B.A. in Environmental Biology from California State University, Fresno, 1992. Experience conducting surveys for rare plants and doing wetland delineations in the Central Valley, desert, and coast ranges of California since 1991.
- Karen Dulik, Land Retirement Botanist, ESRP, at the time of the surveys. M.S. in Agriculture (major in Soil Science) from California Polytechnic State University, San Luis Obispo, 1997. Experience working with native plant restoration, weed management, and endangered species in the Central Valley and coast ranges of California and Willamette Valley of Oregon since 1995.
- Justine Smith Kokx, Assistant Botanist, ESRP. A.S. in Forestry and Natural Resources from Reedley College, 1998; B.A. in French from California State University, Fresno, 1996; current Biology student at California State University, Fresno. Experience

working with native plant restoration, plant surveys, and endangered species in the Central Valley of California and Sierra Nevada since 1996.

- John Silvas, part-time Field Biologist, ESRP, and part-time environmental consultant. Training in Ornamental Horticulture at Reedley College and in Biology at Fresno City College. Experience conducting surveys for rare plants and doing wetland delineations in the Central Valley of California since 1996.

2.2.3. Mohave Ground Squirrel

Livetrapping for Mohave ground squirrels was conducted during April 1-13 and May 6-18, 2001, and March 26-April 5 and May 6-17, 2002. Trapping was conducted according to conditions in Memoranda of Understanding between CDFG and Phillip Leitner, Thomas Kucera, and Patrick Kelly. The surveys were conducted by the following personnel:

- Phillip Leitner, Mohave Ground Squirrel Task Leader, 2001, ESRP. Ph.D. in Zoology, University of California, Los Angeles, 1961. M.A. in Zoology, 1960, University of California, Los Angeles. B.S. in Zoology, Saint Mary's College of California, 1958.
- Thomas Kucera, Project Manager and Mohave Ground Squirrel Task Leader, 2002, ESRP. Ph.D. in Wildland Resource Science, University of California, Berkeley, 1988. M.S. in Resource Ecology, the University of Michigan, 1976. B.A., Psychology and Zoology, Western Michigan University, 1969.
- Patrick Kelly, Coordinator, ESRP. Ph.D. in Integrative Biology, University of California, Berkeley, 1990.
- Sean Avent, biologist, ESRP. M.A. in Marine Biology. San Francisco State University, 2002. B.S. in Biological Oceanography, University of Washington, 1996.
- Tiffanie Brown, biologist, ESRP. B.S. in Zoology/Marine Biology, Humboldt State University, Arcata, 2000.
- Howard Clark, biologist, ESRP. M.S. in Biology, Fresno State University, 2001, B.S. in Biology, California State University, Stanislaus, 1998.
- Adam Harpster, biologist, ESRP. B.A. in Wildlife and Fisheries Science, The Pennsylvania State University, 1998.
- Noriko Kawamoto, biologist, ESRP. M.S. in Water Resources Management, 1983, University of Wisconsin, Madison. A.B. in Marine Biology, 1979, Occidental College, Los Angeles, California
- Kim Kreitenger, biologist, ESRP. B.A. in Biological Science, Northern Illinois University, De Kalb, Illinois, 1996.
- Brita Larsson, biologist, ESRP. M.S. in Biology, San Francisco State University, 1996. B.S. in Biology, California Polytechnic University, San Luis Obisbo, 1977

- Matt Lloyd, biologist, ESRP. M.S. in Biology, University of Wisconsin-Eau Claire, 2001; B.S. in Biology, 1999, University of Wisconsin-Eau Claire.
- Steve Messer, biologist, ESRP. B.S. in Biology, California State University, Fresno, 1998
- Patrick Morrison, biologist, ESRP. Undergraduate student, California State University, Fresno
- Darren Newman, biologist, ESRP. B.A. in Environmental Biology, California State University, Fresno, 1992.
- Henning Schreiber, biologist, ESRP. Ph.D. in Landscape Ecology, Faculty of Mathematics and Natural Science, Westfälische Wilhelms-University, Münster, 1997. M.S. in Geography, Department of Geography, Westfälische Wilhelms-University, Münster, 1991.
- Debbie Smith, biologist, ESRP. Ph.D. student, Univ. of Washington; M.S. in Integrative Biology, University of California, Los Angeles, 1997; B.S. Biological Science, Saint Mary's College of California, 1989.
- Foung Vang, biologist, ESRP. B.A. in Applied Ecology, University of California, Irvine, 1999.

2.2.4. Desert Tortoise

Desert tortoise surveys were conducted on June 20-22, 2001, by:

- Alice Karl, Desert Tortoise Task Leader. Ph.D. Ecology, University of California, Davis, 1998; M.S. Environmental Biology, California State University, Northridge, 1982; B.A. Biology, California State University, Northridge 1976.
- Thomas Kucera.
- Steve Boland. B.S. Environmental Biology, California State University, Fresno, 1985.
- Gilbert Goodlett, B.S. Engineering, Mississippi State University, 1987.
- Peggy Wood. M.S. Wildlife Ecology, Utah State University, 1986; B.S. Wildlife Science, Rutgers University, 1984.
- Erich Green. Tortoise observer since approximately 1998.
- David Roddy. B.S. Biology, University of California, Riverside, 1979.
- Mercy Vaughn. B.A. Ecology and Evolutionary Biology, University of Arizona, 1993.

2.2.5. Swainson's Hawk

Swainson's hawk surveys were conducted by Thomas Kucera on March 18 and 24, 2001. Additional information on Swainson's hawks was provided by Mr. Ron Schlorff of CDFG and Ms. Karen Sernka, Western Ecological Services, who has been conducting research on Swainson's hawk in California with CDFG since 1998.

2.2.6. Bats

Bat surveys were conducted on May 15-16 and October 8-9, 2001, by Patrick Kelly, Wendy Philpott, and Daniel Williams.

2.2.7. Nocturnal Terrestrial Mammals

Surveys for nocturnal small mammals were conducted during October8-11, 2001 by:

- Daniel Williams, Task Leader
- Patrick Kelly
- Thomas Kucera
- Adam Harpster,
- Steve Messer
- Darren Newman

2.3. Agency Coordination and Professional Contacts

2.3.1. Wetland

Susan DeSaddi, Regulatory Branch, Los Angeles Army Corps of Engineers. April 9, 2003.

2.3.2. Botanical/Vegetation

Mark Bagley, Consulting Biologist, Bishop, CA, February 11, 2003.

Anne Halford, Botanist, U.S. Bureau of Land Management, Bishop, CA, January 24, 2002.

Paula Hubbard, Botanist, Los Angeles Department of Water and Power, Bishop, CA, January 24, 2002.

Dr. Ron Kelley, Professor, Eastern Oregon University, La Grande, OR, February 19, 2003.

Tim Messick, Botanist, Jones and Stokes, Sacramento, CA, January 29 and February 5, 2002.

Dr. Dean William Taylor, Fellow, Jepson Herbarium, Berkeley, CA, January 30, 2003.

Tim Thomas, Biologist, U.S. Fish and Wildlife Service, Barstow, CA, August 19 and October 1, 2002.

Dr. Arnold Tiehm, Professor, University of Nevada, Reno, NV, January 9, 2003.

2.3.3. Wildlife

Adrienne Disbrow, Environmental Scientist, CDFG, Bishop, California., July 16, 2002.

John Gustafson, Wildlife Biologist, CDFG, Sacramento, California,

Denyse Racine, Wildlife Biologist, CDFG, Bishop, California

Terry Russi, Wildlife Biologist, BLM, Bishop, California, 16 March 2001

Ron Schlorff, Wildlife Biologist, CDFG, Sacramento, California, 12 March 2001

Karyn Sernka, Wildlife Biologist, Western EcoSystems Technology, Inc., 17 May 2001, 29 July 2002

George Walker, Wildlife Biologist, USFWS, Barstow, California, 4 October 2001

Darryl Wong, Supervisory Biologist, CDFG, Bishop, California, 16 March 2001

2.4. Limitations That May Influence Results

2.4.1. General Limitation

The survey area includes government-owned (BLM, City of Los Angeles) and private land. In 1999 Caltrans sent Notice of Intent to Enter To Conduct Field Survey letters to 127 private property owners requesting permission enter their land to conduct environmental surveys. Out of the 127 letters sent, 2 land owners denied survey crews access and 19 land owners did not respond to the letter; therefore it was assumed that access was denied. Biological surveys did not occur in the above mentioned areas.

2.4.2. Vegetation Surveys

Lack of access to some private properties resulted in some gaps in the plant surveys. However, remote observations indicated that the inaccessible areas appeared to have low potential for sensitive species due to their degraded condition caused by development, off-highway vehicle disturbance, or livestock grazing.

The plant surveys extended 61 m (200 ft) east of the existing lanes of Highway 395. Maps of the alternative alignments provided provided by Caltrans in Fall 2002, after the surveys were completed, show that Alternative 2 extends approximately 135 m (443 ft) east of the existing highway. Thus, the project area extends 74 m (243 ft) further than was surveyed. It is quite possible that rare plants occur in the unsurveyed portion of the study area east of Grant and could be affected by Alignment 2.

Relatively dry conditions during the growing seasons of 2000-2001 and 2001-2002 created unfavorable growing conditions for annual and bulbous perennial plants. Some plant species whose seeds or bulbs are present in the area may have failed to germinate or flower during the survey period (Paula Hubbard personal communication 2002), making them undetectable or unidentifiable. Among the plants that did grow during spring 2001, a few species had not yet reached the flowering stage by the final plant survey, but they were identifiable to genus.

2.4.3. Wildlife Surveys

Surveys for the desert tortoise were constrained by access to private property.

Surveys for Mohave ground squirrel were done by putting trap grids in what appeared to be the most suitable habitat within the study area. One-hundred percent coverage of the study area was not possible.

3. Results: Environmental Setting

3.1. Description of the Existing Biological and Physical Conditions

3.1.1. Study Area

The biological study area comprised a large corridor beginning just south of the Los Angeles Aqueduct Bridge No. 48-10 at KP49.5 (PM 30.8) and going north to the Ash Creek Bridge No. 48-11 at KP 67.4 (PM 41.9). The western boundary was the Los Angeles aqueduct and the high-voltage transmission line located at the north end of the project. The eastern boundary was 61 m (200 ft) from the existing pavement (Figure 2). The area comprises 1,372 ha (3,392 ac).

3.1.2. Physical Conditions

The project area is in a narrow, arid basin east of the steep eastern escarpment of the Sierra Nevada and west of the Inyo and Coso mountains (Figures 1 and 2). North of Olancha it borders the western shore of Owens Lake. Elevation of the existing Hwy. 395 at Olancha is about 1,150 m; 9 km (6 mi) west, elevation exceeds 3,500 m (11,800 ft). Local streams draining the Sierra Nevada, in particular Olancha and Cartago creeks, flow east, and originally terminated in Owens Lake, as did the Owens River, flowing in from the north. Most of these waters have been diverted into the Los Angeles aqueduct system, but there is still some flow to irrigated pastures west of Hwy. 395.

3.1.3. Biological Conditions in the Biological Study Area

There are 10 natural plant communities in the study area, plus the human-modified plant community, alfalfa field (Figure 7). These are named and discussed below according to the classification of Sawyer and Keeler-Wolf (1995). Equivalent plant community classifications according to the California Natural Diversity Data Base (2002b) and Holland (1986) are presented in Appendix B. Developed ("urban") areas are also present in the study area (Figure 7, Table 2); they will not be discussed further because they are not natural communities.

Figure 7. Vegetation communities and existing alignment.

Table 3. Area occupied by each plant community and developed lands in the study area. Series names follow Sawyer and Keeler-Wolf (1995).

Plant community	Hectares	Acres	Percent of total
Alfalfa field	2.1	5.1	0.15
Big Sagebrush Series	270.0	667.2	19.21
Bulrush Series	13.4	33.0	0.95
Creosote Bush Series	146.9	362.9	10.45
Fremont Cottonwood Series	21.9	54.0	1.56
Greasewood Series	14.5	35.7	1.03
Mixed Saltbush Series	52.8	130.4	3.75
Mixed Willow Series	6.7	16.4	0.47
Rubber Rabbitbrush Series	13.7	33.9	0.98
Saltgrass Series	36.1	89.2	2.57
Shadscale Series	751.9	1,858.1	53.49
Urban	75.8	187.4	5.40
Total	1,405.6	3,473.4	100

Alfalfa Field – The only alfalfa field in the study area occurs at Olancha, west of Highway 395 and south of Olancha Creek (Figure 7). This vegetation type is not a natural community. It consists of planted alfalfa (*Medicago sativa*) that is watered artificially. The alfalfa field occupies less area than any other plant community in the study area (Table 3).

Big Sagebrush Series - This plant community occurs on the west side of Highway 395 from approximately 10 km (6 mi) south of the northern edge of the study area southward to Olancha Creek (Figure 7). It covers more of the study area than any other vegetation type except the Shadscale Series (Table 3). The Big Sagebrush Series is an upland vegetation type dominated by shrubs, with annual grasses and wildflowers in the ground layer. The dominant species is big sagebrush (*Artemisia tridentata*). Other typical species of this series observed in the study area are rabbitbrush (*Chrysothamnus* species) and green ephedra (*Ephedra viridis*). The shrub four-wing saltbush (*Atriplex canescens*) also is present but is not characteristic of the series. Annual herbs include cheatgrass (*Bromus tectorum*) and Wilcox's woolly-star (*Eriastrum wilcoxii*). The series is found on well-drained, gravelly soils in a variety of sites including valleys, dry washes, and alluvial fans (Sawyer and Keeler-Wolf 1995).

Bulrush Series - This community is found towards the northern end of the study area, east of the existing highway (Figure 7). The dominant species of this series are herbs, including common three-square (*Scirpus americanus*), Parish's spikerush (*Eleocharis parishii*), and Baltic rush (*Juncus balticus*); sedges (*Carex* species) are abundant but not dominant. Although this community includes elements of the Saltgrass Series (below) and Spikerush

Series (Sawyer and Keeler-Wolf 1995), it is called the Bulrush Series here due to the importance of common three-square. The important species are primarily obligate wetland plants (Reed 1988). Additional species observed in the Bulrush Series within the study area include cow's clover (*Trifolium wormskioldii*), cut-leaf water-parsnip (*Berula erecta*), and a non-native plant, birds-foot trefoil (*Lotus corniculatus*). The Bulrush Series may be either permanently or seasonally flooded and may have either fresh, alkaline, or saline water chemistry (Sawyer and Keeler-Wolf 1995).

Creosote Bush Series - The Creosote Bush Series occupies a narrow strip more than 3 km (2 mi) long, with its southern extent just north of Cartago (Figure 7). It is an upland vegetation type dominated by shrubs. The ground cover is sparse except for the presence of spring or summer annuals (Sawyer and Keeler-Wolf 1995). The dominant species in this series is creosote bush (Larrea tridentata). This series intergrades with the Shadscale Series in the study area, and thus many of the same plant species are present, although they are more characteristic of the Creosote Bush Series than the Shadscale Series (Sawyer and Keeler-Wolf 1995). Such species include hop-sage (*Grayia spinosa*), white bursage (*Ambrosia dumosa*), valley saltbush (*Atriplex polycarpa*), goldenbush (*Ericameria cooperi*), and cheesebush (*Hymenoclea salsola*). This community is found on droughty, well-drained soils of flats, slopes, alluvial fans, and valleys (Vasek and Barbour 1977, Holland 1986, Sawyer and Keeler-Wolf 1995). The study area represents the northern range limit for the Creosote Bush Series in the Owens Valley, although it continues farther north on the east side of Owens Lake (Kuchler 1977).

Fremont Cottonwood Series – This series occurs along Olancha and Cartago creeks (Figure 7), which are the primary local drainages flowing from the Sierra Nevada to the study area. The Fremont Cottonwood Series is typical of riparian areas, where soils are flooded intermittently by fresh water but remain saturated continuously (Sawyer and Keeler-Wolf 1995). The dominant species in the Fremont Cottonwood Series are trees. Fremont cottonwood (*Populus fremontii*), a facultative wetland species, dominates the overstory along the creek banks. Red willow (*Salix laevigata*), narrow-leaf willow (*S. exigua*), and black willow (*S. gooddingii*) are the dominant species in the understory, and thus this series is similar to the Mixed Willow Series (see below).

Greasewood Series - A small patch of the Greasewood Series is located just south of Olancha and immediately west of Highway 395 (Figure 7). This vegetation type is dominated by the shrub greasewood (*Sarcobatus vermiculatus*), a facultative upland species (Reed 1988). This series is found on moist lakebeds and similar sites with saturated, saline soils that are flooded intermittently (Holland 1986, Sawyer and Keeler-Wolf 1995).

Mixed Saltbush Series - A distinct patch of this series occurs just south of Olancha Creek and south of the town of Olancha (Figure 7). In the study area, the Mixed Saltbush Series intergrades with the Shadscale and Greasewood series, a pattern that is common around the margins of dry lakes (Vasek and Barbour 1977). The Mixed Saltbush Series is a shrub-dominated community with a sparse ground cover (Sawyer and Keeler-Wolf 1995). The dominants are shadscale (*Atriplex confertifolia*), four-wing saltbush, valley saltbush, and spiny saltbush (*Atriplex spinifera*). However, many other species are present, including those noted below under the Shadscale Series.

Mixed Willow Series - This vegetation community occurs in two small patches within the study area (Figure 7). As is typical of the Mixed Willow Series, the soils in these areas are saturated with fresh water and the habitat is flooded seasonally (Sawyer and Keeler-Wolf 1995). Red willow, narrow-leaf willow, and black willow dominate the Mixed Willow Series in the study area. The last two are obligate wetland species; red willow is not listed in the National List of Plant Species That Occur in Wetlands (Reed 1988). Woody understory species include rabbitbrush and interior rose (*Rosa woodsii*). The ground layer comprises obligate wetland plants (Reed 1988) such as yerba mansa (*Anemopsis californica*), Baltic rush, and a hybrid cattail (*Typha x glauca*).

Rubber Rabbitbrush Series - This series is found in a small area along the west side of Highway 395 just north of Olancha Creek (Figure 7), where rubber rabbitbrush (Chrysothamnus nauseosus) is virtually the only plant species present. The Rubber Rabbitbrush Series intergrades with the Shadscale Series upslope to the west of Olancha. This vegetation type is found on well-drained, gravelly soils (Sawyer and Keeler-Wolf 1995) and is indicative of site disturbance (Holland 1986).

Saltgrass Series - This vegetation community occurs east of Highway 395, from Highway 190 northward (Figure 7). The Saltgrass Series is characterized by the presence of saltgrass (*Distichlis spicata*) as the dominant ground cover (Sawyer and Keeler-Wolf 1995). However, Baltic rush co-dominates in the study area. Other important plants found in this community include alkali sacaton (*Sporobolus airoides*) and yerba mansa. Additional species commonly observed in the Saltgrass Series within the study area (in order of abundance) include Bermuda grass (*Cynodon dactylon*), annual rabbit-foot grass (*Polypogon monspeliensis*), western borax-weed (*Nitrophila occidentalis*), and salt marsh bird's-beak (*Cordylanthus maritimus* ssp. *canescens*). This habitat is permanently saturated and has a shallow water table and saline water chemistry (Sawyer and Keeler-Wolf 1995). The dominant and other important species observed in the study area have been characterized as obligate or facultative wetland plants (Reed 1988).

Shadscale Series - This series is the most widespread vegetation type in the study area, accounting for more than half of the natural vegetation (Figure 7). It intergrades with the Big Sagebrush, Creosote Bush, Greasewood, and Mixed Saltbush series. The Shadscale Series is an upland vegetation type dominated by shrubs but occurs in drier sites than the Big Sagebush Series (Vasek and Barbour 1977). The ground layer in the Shadscale Series is sparse (Sawyer and Keeler-Wolf 1995) except in spring, when showy annual wildflowers appear. Shadscale dominates this community. A wide variety of other shrubs are found in this vegetation type in the study area, including (in order of abundance) hop-sage, cheesebush, budsage (*Artemisia spinescens*), white bursage, and winterfat. The Shadscale Series is not homogeneous throughout the study area; some patches contain significant amounts of four-wing saltbush, spiny saltbush, or valley saltbush. These patches are similar to Mixed Saltbush (above) but have not been mapped separately. The Shadscale Series can occur on either poorly-drained flats with saline or alkaline soils or on well-drained slopes (Vasek and Barbour 1977, Holland 1986).

As discussed in Section 4.1, 10 invasive plants occur in the study area, but they are generally not widespread. These invasive species are giant reed (*Arundo donax*), wild oats (*Avena fatua*), five-horn bassia (*Bassia hyssopifolia*), red brome (*Bromus madritensis* ssp. *rubens*), cheat grass (*Bromus tectorum*), Italian ryegrass (*Lolium multiflorum*), black locust (*Robinia pseudoacacia*), Russian thistle (*Salsola tragus*), Mediterranean grass (*Schismus arabicus*), and salt cedar (*Tamarix ramosissima*).

Common animal species in the area include the side-blotched lizard (*Uta stansburiana*), white-tailed antelope ground squirrel, Merriam's kangaroo rat (*Dipodomys merriami*), turkey vulture (*Cathartes aura*), and common raven (*Corvus corax*). The generally north-south orientation of the Owens Valley facilitates the seasonal migration of birds, and likely that of bats. The only known non-flying mammal migration in the area is that of mule deer in the Sierrra Nevada, which migrate from high-elevation summer ranges to lower elevation winter areas, both of which are well west of the project effect area. Aquatic resources are relatively scarce, because most surface water is captured for export to Los Angeles. Water does flow at least occasionally in some of the creeks, notably Olancha Creek, and some pools and springs exist east of the study area.

3.2. Regional Species and Habitats of Concern

See Methods (Section 2.1) for a discussion of the area that is considered to represent the region.

Table 4. Regional Sensitive Plant Species.

Scientific Name	Common Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Astragalus geyeri var. geyeri	Geyer's milk-vetch	CNPS List 2	Chenopod scrub, Great Basin scrub (sandy)	Present	
Astragalus lentiginosus var. piscinensis	Fish Slough milk-vetch	FT, CNPS List 1B	playas (alkaline)	Absent	No playas in study area. Taxon known only from Fish Slough, >120 km (>75 miles) north of the study area.
Astragalus serenoi var. shockleyi	naked milk-vetch	CNPS List 2	Chenopod scrub, Great Basin scrub, pinyon and juniper woodland (alkaline, granitic alluvium)	Present	
Calochortus excavatus	Inyo County star-tulip	FSC, CNPS List 1B	Chenopod scrub, meadows and seeps (alkaline, mesic)	Present	
Camissonia boothii ssp. boothii	Booth's evening-primrose	CNPS List 2	Joshua tree woodland, pinyon and juniper woodland	Absent	Some Joshua trees in the study area, but not true Joshua tree woodland. Nearest site is approx. 16 km (10 mi) south of the study area in Rose Valley, but not known from the Owens Valley.
Camissonia boothii ssp. intermedia	hairy evening-primrose	CNPS List 2	Great Basin scrub (sandy), pinyon and juniper woodland	Absent	Known from mountains >1,500 m (>4,900 ft) near/in Death Valley. Nearest occurrence approx. 46 km (28 miles) northeast of the study area.
Canbya candida	pygmy poppy	CNPS List 4	Joshua tree woodland, Mohavean desert scrub,pinyon and juniper woodland (sandy, granitic)	Present	

Scientific Name	Common Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Cymopterus ripleyi var. saniculoides	sanicle cymopterus	CNPS List1B	Joshua tree woodland, Mohavean desert scrub (sandy, carbonate)	Present	
Eriogonum wrightii var. olanchense	Olancha Peak buckwheat	CNPS List1B	alpine boulder and rock field, subalpine coniferous forest (gravelly, rocky)	Absent	Habitat not present; occurs above 3,260 m (10,696 ft) elevation.
Hackelia sharsmithii	Sharsmith's stickseed	CNPS List 2	alpine boulder and rock field, subalpine coniferous forest (granitic, rocky)	Absent	Habitat not present; occurs above 3,000 m (9,843 ft) elevation.
Loeflingia squarrosa var. artemisiarum	sagebrush-like loeflingia	CNPS List 2	desert dunes, Great Basin scrub, Sonoran desert scrub (sandy)	Present	
Lupinus magnificus var. glarecola	Coso Mountains lupine	CNPS List 4	Great Basin scrub, Joshua tree woodland, Mohavean desert scrub (granitic)	Present	
Lupinus magnificus var. magnificus	Panamint Mountains lupine	FSC, CNPS List1B	Great Basin scrub, Mohavean desert scrub, coniferous forest	Absent	Communities present, but this species is known only from Panamint and Coso Ranges, not from the Owens Valley floor.
Lupinus padre-crowleyi	Father Crowley's lupine	FSC, SR, CNPS List1B	Great Basin scrub, riparian scrub, coniferous forest (decompos-ed granitic)	Absent	Habitat not present; occurs above 2,500 m (8,202 ft) elevation.
Monardella beneolens	sweet-smelling monardella	CNPS List1B	Alpine boulder and rock field, coniferous forest (granitic)	Absent	Habitat not present; occurs above 2,500 m (8,202 ft) elevation.

Scientific Name	Common Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Muilla coronata	crowned muilla	CNPS List 4	Joshua tree woodland, Mohavean desert scrub, pinyon and juniper woodland	Present	
Oryctes nevadensis	Nevada oryctes	FSC, CNPS List 2	Chenopod scrub, Mohavean desert scrub (sandy)	Present	
Phacelia inyoensis	Inyo phacelia	CNPS List1B	meadows and seeps (alkaline)	Present	
Phacelia nashiana	Charlotte's phacelia	FSC, CNPS List1B	Joshua tree woodland, Mohavean desert scrub, pinyon and juniper woodland	Present	
Plagiobothrys parishii	Parish's popcorn-flower	CNPS List1B	Great Basin scrub, Joshua tree woodland (alkaline, mesic)	Present	
Populus angustifolia	narrow-leaved cottonwood	CNPS List 2	Riparian scrub	Absent	Riparian scrub present, but this species is known only from 1,800 to 2,100 m (6,000 to 7,000 ft) elevation.
Selaginella leucobryoides	Mohave spike-moss	CNPS List 4	Great Basin scrub, Mohavean desert scrub, pinyon and juniper woodland, coniferous forest (rocky, carbonate)	Absent	Communities present, but this species needs cracks in limestone, which are not present. Occurs only in Panamint, Kingston, and Providence Mountains.
Sidalcea covillei	Owens Valley checkerbloom	FSC, SE, CNPS List1B	Chenopod scrub, meadows and seeps (alkaline, mesic)	Present	

Scientific Name	Common Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Spartina gracilis	alkali cord grass	CNPS List 4	Great Basin scrub, meadows and seeps, marshes and swamps (alkaline)	Present	
Trifolium macilentum var. dedeckerae	DeDecker's clover	CNPS List1B	coniferous forest, pinyon and juniper woodland (granitic, rocky)	Absent	Habitat not present; occurs above 2,100 m (6,890 ft) elevation.

Absent = no further work needed.: Present = general habitat is present and species may be present. Status: Federal Threatened (FT); Federal Species of Concern (FSC); State Endangered (SE); State Rare (SR); California Native Plant Society (CNPS). CNPS List 1B = "Plants rare, threatened, or endangered in California and elsewhere." CNPS List 2 = "Plants rare, threatened, or endangered in California, but more common elsewhere." CNPS List 4 = "Plants of limited distribution—a watch list."

Table 5. Regional Sensitive Wildlife Species.

Scientific Name	Common Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Pseudocopaeodes eunus	Alkali skipper	FSC	Alkaline flats with saltgrass	Present	
Pyrgulopsis wongi	Wong's springsnail	FSC Calif: SA, S1S2	Seeps and small spring-fed streams	Absent	Seeps and springs not present
Gila bicolor snyderi	Owens tui chub	FE SE	Streams, spring-fed ponds	Absent	Streams, spring-fed ponds absent
Cyprinodon radiosus	Owens pupfish	FE SE	Streams, clear ponds	Absent	No water present
Gopherus agassiziii	Desert tortoise	FT ST	Creosote scrub and other desert scrub	Present	Habitat may be present; probably north of its native range
Ixobrychus exilis hesperis	Western least bittern	FSC SSC	Cattail and bullrush marshes	Absent	No marshes present
Circus cyaneus	Northern harrier	SSC	Nests in grasslands and wetlands, forages over open terrain	Present	

Scientific Name	Common Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Accipiter striatus	Sharp-shinned hawk	SSC	Nests in forests; hunts in forests and open areas	Present	Present in winter
Accipiter cooperi	Cooper's hawk	SSC	Nests in forests; hunts in forests and open areas	Present	Present in winter
Buteo regalis	Ferruginous hawk	FSC SSC	Winters in W and SW North America	Present	Present in winter
Buteo swainsoni	Swainson's hawk	ST	Nests in trees in open habitats	Present	
Aquila chrysaetos	Golden eagle	SSC	Forages over shrublands and grasslands	Present	
Falco mexicanus	Prairie falcon	SSC	Forages over open lands	Present	May be present while foraging
Charadrius alexandrius nivosus	Western snowy plover	SSC	Shores of alkali lakes and playas	Absent	No shores in project area
Numenius americanus	Long-billed curlew	SSC	Nests in dense riparian forest	Absent	No dense riparian forest present
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	SE	Nests in dense riparian forest	Absent	No dense riparian forest present
Athene cunicularia	Burrowing owl	FSC SSC	Nests in rodent burrows in grasslands, forages in open habitat	Present	
Asio otus	Long-eared owl	SSC	Nests in dense riparian forest; forages in open habitat	Present	May be present while foraging
Empidonax trailii	Willow flycatcher	FE SE	Nests in dense willow riparian vegetation	Absent	No dense willow riparian vegetation
Lanius ludovicianus	Loggerhead shrike	FSC SSC	Woodlands, shrublands, open areas	Present	

Scientific Name	Common Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Vireo belli pusillus	Least Bell's vireo	FE SE	Riparian forests and willow scrub	Absent	No riparian forests and willow scrub
Riparia riparia	Bank swallow	ST	Nests in colonies in riverbanks, cliffs, and road cuts	Absent	No riverbanks, cliffs, or road cuts
Toxostoma lecontei	LeConte's thrasher	SSC	Open shrubland, alkaline flats	Present	
Dendroica petechia	Yellow warbler	SSC	Willow and cottonwood riparian	Absent	No riparian woodlands present
Ictera virens	Yellow-breasted chat	SSC	Dense riparian habitat	Absent	No dense riparian habitat present
Antrozous pallidus	Pallid bat	SSC	Roosts in caves, mines, rock outcrops, trees	Present	
Euderma maculatum	Spotted bat	FSC SSC	Roosts in cliffs. forages on moths captured over water	Present	
Plecotus townsendii townsendii	Townsend's western big-eared bat	FSC SSC	Roosts in caves, tunnels, mines; feeds on moths	Present	
Myotis ciliolabrum	Small-footed myotis	FSC	Roosts in caves, mines, rock outcrops, forages low among trees or brush	Present	
Myotis volans	Long-legged bat	FSC	Open forests and shrublands	Present	
Myotis yumanensis	Yuma myotis	FSC SSC	Arid areas, open woods	Present	
Myotis evotis	Long-eared myotis	FSC	Sparse forests	Present	
Myotis thysanodes	Fringed myotis	FSC	Open woods; feeds on moths	Present	

Scientific Name	Common Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Spermophilus mohavensis	Mohave ground squirrel	FCS ST	Mohave desert scrub	Present	
Microtus californicus vallicola	Owens Valley vole	FSC SSC	Grassy wetlands	Present	

Absent = no further work needed. Present =general habitat is present and species may be present. Status: Federal Endangered (FE); Federal Threatened (FT); Federal Proposed (FP, FPE, FPT); Federal Candidate (FC), Federal Species of Concern (FSC); State Endangered (SE); State Threatened (ST); Fully Protected (FP); State Rare (SR); State Species of Special Concern (SSC)

4. Results: Biological Resources, Discussion of Impacts and Mitigation

4.1. Species Potentially in the Project Area

Table 6. Project Study Area Sensitive Plant Species.

Scientific Name	Common Name	Status	Specific Habitat Present/ Absent	Species Presence/ Absence	Rationale
Astragalus geyeri var. geyeri	Geyer's milk-vetch	CNPS List 2	Present	Absent	Nearest site is approx. 64 km (40 miles) north of the study area in the Blackrock area.
Astragalus serenoi var. shockleyi	naked milk-vetch	CNPS List 2	Present	Absent	Nearest site is approx. 80 km (50 miles) north of the study area near Tinemaha Reservoir.
Calochortus excavatus	Inyo County star-tulip	FSC, CNPS List 1B	Present	Absent	Possibly present just east of the study area. Nearest confirmed site is approx. 19 km (12 miles) north of the study area in the Alabama Hills.
Canbya candida	pygmy poppy	CNPS List 4	Present	Present	Found in study area.
Cymopterus ripleyi var. saniculoides	sanicle cymopterus	CNPS List1B	Present	Absent	Known to occur east of the study area (Bagley and Leatherman 1999).
Loeflingia squarrosa var. artemisiarum	sagebrush-like loeflingia	CNPS List 2	Present	Absent	Nearest site is approx. 76 km (47 miles) north of the study area near Tinemaha Reservoir.
Lupinus magnificus var. glarecola	Coso Mountains lupine	CNPS List 4	Present	Absent	Appears only after fires so may not be detectable.
Muilla coronata	crowned muilla	CNPS List 4	Present	Present	Possibly present--only leaves were seen. Not found in flower in 2001 or 2002.
Oryctes nevadensis	Nevada oryctes	FSC, CNPS List 2	Present	Absent	Nearest site is approx. 21 km (13 miles) north of the study area, southeast of Lone Pine.

Scientific Name	Common Name	Status	Specific Habitat Present/ Absent	Species Presence/ Absence	Rationale
Phacelia inyoensis	Inyo phacelia	CNPS List1B	Present	Absent	Nearest site is approx. 19 km (12 miles) north of the study area in the Alabama Hills.
Phacelia nashiana	Charlotte's phacelia	FSC, CNPS List1B	Present	Absent	Nearest site is approx. 13 km (8 miles) southwest of the study area in Haiwee Pass. None known in Owens Valley.
Plagiobothrys parishii	Parish's popcorn-flower	CNPS List1B	Present	Absent	Found adjacent to study area but not within.
Sidalcea covillei	Owens Valley checkerbloom	FSC, SE, CNPS List1B	Present	Absent	Found adjacent to study area but not within.
Spartina gracilis	alkali cord grass	CNPS List 4	Present	Absent	Known to occur just east of the study area (Bagley and Leatherman 1999).

Absent = no further work needed. Present = general habitat is present and species may be present. Status: Federal Species of Concern (FSC); State Endangered (SE); California Native Plant Society (CNPS). CNPS List 1B = "Plants rare, threatened, or endangered in California and elsewhere." CNPS List 2 = "Plants rare, threatened, or endangered in California, but more common elsewhere." CNPS List 4 = "Plants of limited distribution—a watch list."

Table 7. Project Study Area Sensitive Wildlife Species.

Scientific Name	Common Name	Status	Specific Habitat Present/ Absent	Species Presence/ Absence	Rationale
Pseudocopaeodes eunus	Alkali skipper	FSC	Alkaline flats with saltgrass	Present	Alkali meadows present
Gopherus agassiziii	Desert tortoise	FT ST	Creosote scrub and other desert scrub	Absent	Probably north of its native range
Circus cyaneus	Northern harrier	SSC	Nests in grasslands and wetlands, forages over open terrain	Present	Observed in study area

Scientific Name	Common Name	Status	Specific Habitat Present/ Absent	Species Presence/ Absence	Rationale
Accipiter striatus	Sharp-shinned hawk	SSC	Nests in forests; hunts in forests and open areas	Present	Present in winter
Accipiter cooperi	Cooper's hawk	SSC	Nests in forests; hunts in forests and open areas	Present	Observed in study area
Buteo regalis	Ferruginous hawk	FSC SSD	Winters in W and SW North America	Present	Present in winter
Buteo swainsoni	Swainson's hawk	ST	Nests in trees in open habitats	Present	Present
Aquila chrysaetos	Golden eagle	SSC	Forages over shrublands and grasslands	Present	Present
Falco mexicanus	Prairie falcon	SSC	Forages over open lands	Present	May be present while foraging
Athene cunicularia	Burrowing owl	FSC SSC	Nests in rodent burrows in grasslands, forages in open habitat	Present	Not observed in study area
Asio otus	Long-eared owl	SSC	Nests in dense riparian forest; forages in open habitat	Present	May be present while foraging
Lanius ludovicianus	Loggerhead shrike	FSC SSC	Woodlands, shrublands, open areas	Present	Observed in study area
Toxostoma lecontei	LeConte's thrasher	SSC	Open shrubland, alkaline flats	Present	Not detected
Antrozous pallidus	Pallid bat	SSC	Roosts in caves, mines, rock outcrops, trees	Present	Detected in surveys

Scientific Name	Common Name	Status	Specific Habitat Present/ Absent	Species Presence/ Absence	Rationale
Euderma maculatum	Spotted bat	FSC SSC	Roosts in cliffs. forages on moths captured over water	Absent	Not detected in surveys
Plecotus townsendii townsendii	Townsend's western big-eared bat	FSC SSC	Roosts in caves, tunnels, mines; feeds on moths	Absent	Not detected in surveys
Myotis ciliolabrum	Small-footed myotis	FSC	Roosts in caves, mines, rock outcrops, forages low among trees or brush	Present	Possibly detected in surveys
Myotis volans	Long-legged bat	FSC	Open forests and shrublands	Present	Possibly detected in surveys
Myotis yumanensis	Yuma myotis	FSC SSC	Arid areas, open woods	Present	Detected in surveys
Myotis evotis	Long-eared myotis	FSC	Sparse forests	Absent	Not detected in surveys
Myotis thysanodes	Fringed myotis	FSC	Open woods; feeds on moths	Absent	Not detected in surveys
Spermophilus mohavensis	Mohave ground squirrel	FCS ST	Mohave desert scrub	Present	Detected in surveys
Microtus californicus vallicola	Owens Valley vole	FSC SSC	Grassy wetlands	Present	Detected in surveys

Absent = no further work needed. Present = general habitat is present and species may be present. Status: Federal Endangered (FE); Federal Threatened (FT); Federal Proposed (FP, FPE, FPT); Federal Candidate (FC), Federal Species of Concern (FSC); State Endangered (SE); State Threatened (ST); Fully Protected (FP); State Rare (SR); State Species of Special Concern (SSC).

Species observed in the study area include 209 plants in 47 families (Appendix C). Eight plant taxa were not identifiable to species at the phenological stage that we observed. Among the 201 plants keyed to species, 171 (85.1 percent) are native to California and the remaining 30 (14.9 percent) are non-native.

Ten of the non-native plant species are included on the California Exotic Pest Plant Council's ([CalEPPC] 1999) lists of Exotic Pest Plants of Greatest Ecological Concern in California.

Giant reed (*Arundo donax*), cheat grass, and salt cedar (*Tamarix ramosissima*) are on List A-1, which includes the "Most Invasive Wildland Pest Plants; Widespread." Red brome (*Bromus madritensis* ssp. *rubens*) is on List A-2, which is defined as "Most Invasive Wildland Pest Plants; Regional." Two species found in the area, five-horn bassia and black locust, are on CalEPPC's List B, "Wildland Pest Plants of Lesser Invasiveness." CalEPPC includes Russian thistle (*Salsola tragus*) on a list of species for which more information is needed. Finally, three of the species in the study area, wild oats (*Avena fatua*), Italian ryegrass (*Lolium multiflorum*), and Mediterranean grass (*Schismus arabicus*) are on CalEPPC's list of annual grasses that pose significant threats to wildlands but do not qualify for Lists A or B.

None of the non-native, potentially invasive plants appeared to be widespread in the study area during our surveys. However, the annual plants could possibly be more widespread and more invasive in wetter years. Giant reed, wild oats, Italian ryegrass, and Russian thistle occurred only on the roadside along the existing lanes of Highway 395 and were quite sparse. Except for Russian thistle, these species must be recent introductions because DeDecker (1974) did not list them as present in the Owens Valley. Cheat grass and Mediterranean grass also were sparse and were observed only along dirt roads. Red brome was found occasionally in a variety of plant communities but did not grow in dense stands during the survey years. Black locust was found at an old homesite and is planted along Highway 395 in Olancha. Five-horn bassia was confined to an alkaline area north of Cartago near Willow Dip. Salt cedar forms a large stand east of Highway 395 south of Olancha and could spread to other riparian areas if left unchecked.

4.2. Natural Communities of Special Concern

Natural communities of special concern in the study area include those that delineated as wetlands under ACOE guidelines and two additional communities (Fremont Cottonwood Series and Greasewood Series) deemed "rare and worthy of consideration" by the California Natural Diversity Data Base (2002b).

4.2.1. Wetlands

The wetlands mapped near Willow Dip include the Bulrush Series, Mixed Willow Series, and Saltgrass Series plant communities (Figure 8). Because no wetland habitat will be affected by the project, an ACOE permit is not required and, therefore, no further discussion will be presented in this document.

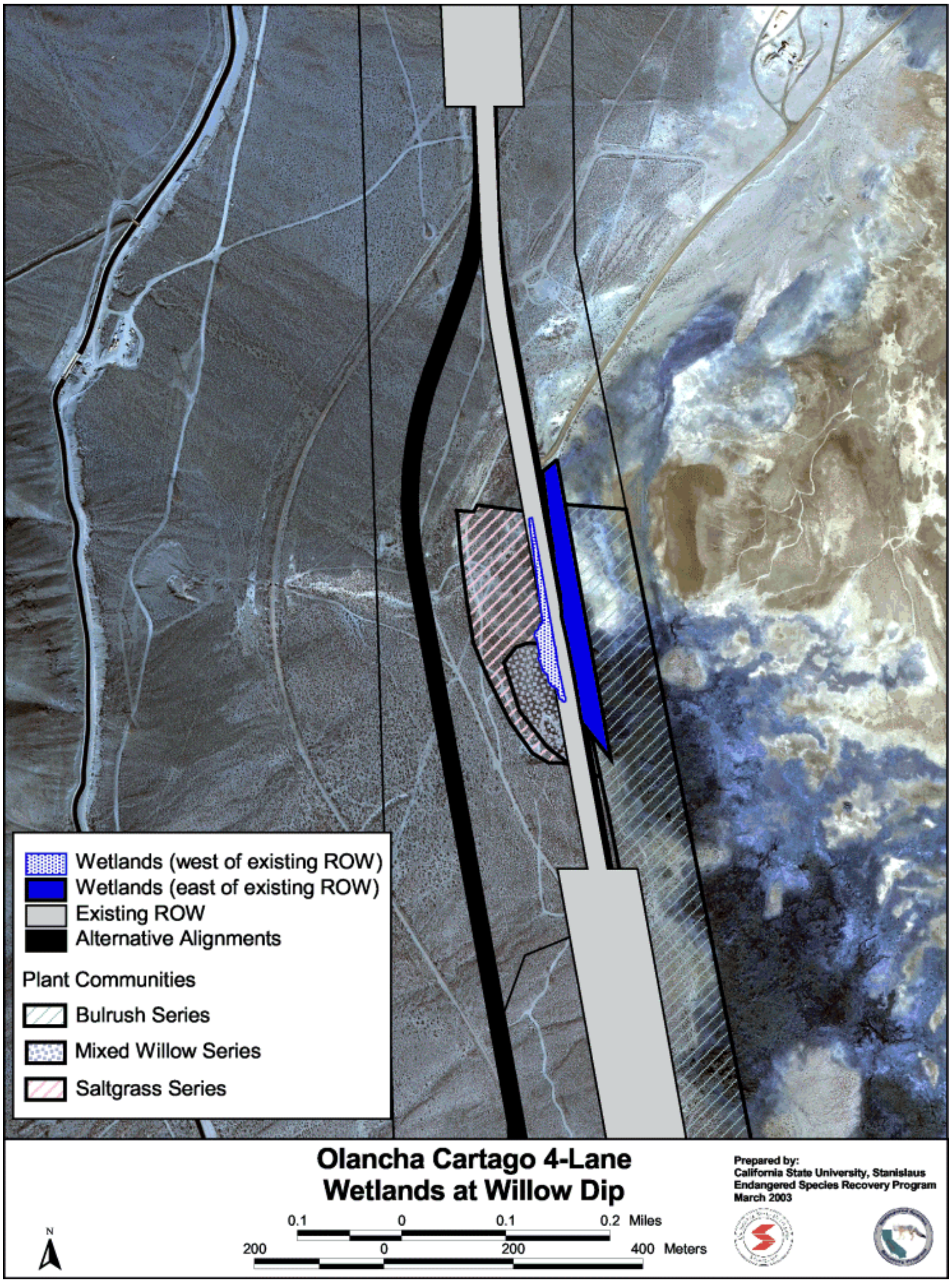

Figure 8. Wetlands at Willow Dip.

4.2.2. Fremont Cottonwood Series

4.2.2.1. Survey Results

In the study area, the Fremont Cottonwood Series occupies approximately 28 ha (70 ac), which is divided between Olancha and Cartago Creeks (Figure 7). This community, under the alternate names Mohave Riparian Forest and Mohave Riparian Association (see Appendix B), is considered rare (CNDDB 2002a, CNDDB 2002b). Although the series in general is considered a wetland type (Sawyer and Keeler-Wolf 1995), in the study area this community did not delineate as a wetland because it met only one of the three wetland parameters (Wendy Philpott personal communication 2003). Dominant species of the Fremont Cottonwood Series were described in Section 3.1.3. Valley saltbush, big sagebrush, and rubber rabbitbrush, shrubs characteristic of the adjacent upland communities, also occur in the understory in the study area. Other common species occurring the Fremont Cottonwood Series in the study area include angelica (*Angelicaleariloba*), Baltic rush, common monkeyflower (*Mimulus guttatus*), giant red paintbrush (*Castilleja miniata*), stinging nettle (*Urtica dioica*), waterpepper (*Polygonum hydropiperoides*), and white sweetclover (*Melilotus alba*). Five of these abundant species are facultative wetland or obligate wetland plants (Reed 1988).

Although four Inyo County occurrences of the Fremont Cottonwood Series are included in CNDDB (2002a), none of them are in the study area. The documented occurrences are along Grapevine Canyon in the Saline Valley (CNDDB Occurrence #3), Jail Canyon in the Panamints (CNDDB Occurrence #15), China Ranch Wash in the Amaragosa Gorge (CNDDB Occurrence #17), and Willow Creek (CNDDB Occurrence #19).

4.2.2.2. Avoidance and Minimization Efforts

It was not possible to avoid this community within the study area because both creeks run perpendicular to the long axis of the Owens Valley (Figure 2 and Figure 7). The only way to have avoided direct effects would be to construct a highway in the Sierra Nevada mountains above the origin of the creeks or out in the bed of Owens Lake, where even more sensitive communities occur. Indirect effects due to hydrological changes will be avoided by installing culverts where the creeks pass under the highway.

4.2.2.3. Project Impacts

All of the proposed alternatives would directly affect the Fremont Cottonwood Series in both the Olancha and Cartago Creek drainages. Alternative 1 would affect the smallest area of the Fremont Cottonwood Series, at 0.11 hectare (0.26 acre). Direct effects are progressively larger for each alternative, although all are less than 1.4 ha (3.5 ac). Alternatives 2, 2a, 3, and 3a would affect 0.76 ha (1.87 ac), 1.02 ha (2.53 ac), 1.03 ha (2.54 ac), and 1.31 ha (3.23 ac), respectively.

Indirect effects to the Fremont Cottonwood Series could occur from runoff of pollutants such as oil and gasoline, which may leak from passing vehicles onto the highway and be washed into the stream during storm events. Although this runoff would be periodic, the effect would be permanent because it would occur throughout the life of the highway. The effect would occur from the point where the highway crosses each creek downstream. For Alternatives 1 and 2, the effect would be similar to that occurring due to the existing highway. The only difference would be that runoff would be coming from four lanes rather than the current two lanes. For Alternatives 2a, 3, and 3a, substantially longer reaches of one or both creeks would be affected because the new alignments are much farther upstream than the existing highway. The area affected indirectly under each alternative would be proportional to the area affected directly, as noted above.

4.2.2.4. Compensatory Mitigation

If any Fremont cottonwood or willow trees are destroyed by the project, they will be replaced at a ratio to be determined in consultation with CDFG. The actual number of trees cannot be determined until the preferred alternative is selected and the alignment boundaries are marked by survey crews. The replacement trees will be propagated from trees within the study area to maintain local adaptations and genotypes. All newly planted trees will be monitored for the period to be determined. Watering may be required until the taproot is established. The goal is to maintain 50 percent survival of transplants by 7 years after planting.

4.2.2.5. Cumulative Impacts

The primary threat to the Fremont Cottonwood Series in Inyo County is siltation, which occurs when off-highway vehicle use, mining, burro foraging, and other activities cause erosion into the streams. A minor threat is woodcutting by campers (CNDDB 2002a). No specific instances of these activities or other planned surface-disturbing activities are known from the study area.

4.2.3. Greasewood Series

4.2.3.1. Survey Results

The Greasewood Series occupies approximately 15 ha (37 ac) in the study area just south of Olancha (Figure 7). It is equivalent to Greasewood Scrub in the CNDDB (2002b) system (Appendix B). Where it intergrades with Shadscale Scrub, portions of this plant community could conceivably be considered the Greasewood-Shadscale Association (CNDDB code

36.320.01) if the patch was mapped in finer detail. The Greasewood-Shadscale Association also is considered rare by CNDDB (2002b).

Although the Greasewood Series is identified as a wetland type by Sawyer and Keeler-Wolf (1995), the patch in the study area did not meet the delineation criteria for a wetland established by ACOE (Wendy Philpott personal communication 2003). Greasewood dominates the small patch of this plant community in the study area, which intergrades with the Shadscale Series. Other shrubs and subshrubs found in the Greasewood Series in the study area include shadscale, valley saltbush, cotton-thorn (*Tetradymia stenolepis*), hop-sage, Cooper's box thorn (*Lycium cooperi*), Mohave indigo-bush (*Psorothamnus arborescens*), and goldenhead (*Acamptopappus sphaerocephalus*). Herbs found in this series in the study area are Nuttall's crinklemat (*Tiquilia nuttallii*), desert pepper-grass (*Lepidium fremontii*), desert dandelion (*Malacothrix glabrata*), and Wilcox's woolly-star.

No occurrences of the Greasewood Series are included in Rarefind II (CNDDB 2002a) despite its designation as a community worthy of consideration by CNDDB (2002b).

4.2.3.2. Avoidance and Minimization Efforts

Effects to this community will be minimal even in the worst-case scenario, so minimization efforts are not necessary.

4.2.3.3. Project Impacts

Only Alternative 1 would affect the Greasewood Series. Approximately 0.24 ha (0.59 ac) would be disturbed under this alternative when the existing two-lane highway is widened to four lanes. All other alignments would bypass the Greasewood Series, so no direct effects would be expected other than those currently in existence from the two-lane highway. Indirect effects are not anticipated to this community.

4.2.3.4. Compensatory Mitigation

Mitigation is not being proposed for effects to this community.

4.2.3.5. Cumulative Impacts

Due to the absence of records for the Greasewood Series in CNDDB (2002a), range-wide threats are not known. The Greasewood Series in the study area possibly could be affected in the future by the groundwater pumping proposed by the Western Water Company (Bagley and Leatherman 1999). Because the Greasewood Series is a moisture-dependent community, the greasewood shrubs could die if the groundwater drops below their root zone. Groundwater levels have not been reported in the immediate vicinity of this community in the project area. The two closest groundwater-monitoring wells are vastly different in their levels, making estimation of the local groundwater level difficult. At a well 2.5 km (1.5 mi) south of the project boundary between Highway 395 and Haiwee Reservoir, groundwater was 45.7 m (150.0 ft) below the ground surface in 1976. However, at the next closest well, 6.6 km (4.1 mi) east of the project area at Dirty Socks Spring, groundwater was 0.3 m (1 ft) above the surface in that year (California Department of Water Resources 2003). Groundwater drawdown has been identified as a reason for decline of Owens Valley wetland habitats (USFWS 1996*b*) and a threat to the survival of rare species (Tibor 2001). This series is unlikely to be affected by the dust control project (CH2MHill 2001) because the effect area is well north of the area where the Greasewood Series occurs.

4.3. Special Status Plant Species

The analysis in this section addresses only 14 special-status plants that (1) are known to occur within the project area, (2) we observed within the project area, or (3) have the potential to occur based on the presence of suitable habitat within the project area, even though they were not observed.

4.3.1. Geyer's milk-vetch (*Astragalus geyeri var. geyeri*), CNPS List 2.

4.3.1.1. Survey Results

Geyer's milk-vetch is an annual plant in the pea family (Fabaceae). It flowers from May to August. In California, this taxon occurs in Inyo, Lassen, and Mono counties, but it is also found in six other western states. Of the 23 occurrences in California, 20 are in Lassen County. The elevation range in which it occurs in California is between 1,150 and 1,555 m (3,800 and 5,100 ft). Geyer's milk-vetch grows on sandy flats in a wide variety of plant communities, particularly scrub types such as big sagebrush, greasewood, and shadscale, but it also is found on stabilized dunes (DeDecker 1974, Tibor 2001).

Geyer's milk-vetch was not observed during surveys in the study area. Although the surveys were conducted in late April and early May, possibly before Geyer's milk-vetch started flowering, no vegetative individuals that could have been this taxon were observed. As with other desert annuals, Geyer's milk-vetch seeds may not have germinated in 2001 or 2002 due to the dry weather, so it may not have been visible even if seeds were present. However, only one population is known to occur in the Owens Valley, and it is in the Blackrock area approximately 64 km (40 mi) north of the project limits. The only other Inyo County occurrence is in Deep Springs Valley, approximately 100 km (60 miles) northeast of the study area.

4.3.1.2. Avoidance and Minimization Efforts

Geyer's milk-vetch was not observed in the study area, so avoidance is not applicable. Any potential effects will be minimized by the duff provision. Caltrans intends to collect and respread duff and soil to a depth of 150 mm (6 in). Because Geyer's milk-vetch is an annual plant, viable seeds are likely to be present in the duff and soil wherever mature plants have occurred within the past several years. Thus, even though mature plants were not observed during surveys, if seeds from previous years were present, they would be salvaged. After the accumulated duff and soil are respread within the study area, the seeds would be expected to germinate in the next year of adequate rainfall.

4.3.1.3. Project Impacts

This project is not expected to affect Geyer's milk-vetch because it is not known to occur in the vicinity.

4.3.1.4. Compensatory Mitigation

Mitigation measures are not being proposed for this taxon because it was not found in the study area.

4.3.1.5. Cumulative Effects

Geyer's milk-vetch is not known to occur in the study area, so cumulative effects are not applicable.

4.3.2. Naked milk-vetch (*Astragalus serenoi* var. *shockleyi*), CNPS List 2.

4.3.2.1. Survey Results

Naked milk-vetch is a perennial plant in the pea family. Blooms are present between May and July. This taxon is known from Inyo and Mono counties in California and from Nevada. In California, naked milk-vetch occurs at elevations of approximately 1,189 to 2,134 m (3,900 to 7,000 ft). It grows on bare, gravelly hillsides in sagebrush scrub (Munz and Keck 1959) and in open, alkaline areas within greasewood scrub, shadscale scrub, or pinyon-juniper woodlands (Tibor 2001, CNDDB 2002a).

Naked milk-vetch was not observed in the study area. Even though the surveys concluded about the time naked milk-vetch would be expected to start flowering, vegetative individuals would have been present during the survey period. Naked milk-vetch has a low probability of occurrence in the study area due to the fact that it occurs at somewhat higher elevations. Moreover, the only population known from the Owens Valley is northeast of Tinemaha Reservoir, more than 80 km (50 mi) north of the project boundary.

4.3.2.2. Avoidance and Minimization Efforts

Avoidance and minimization efforts are not necessary because this toxin is not known to occur in the study area.

4.3.2.3. Project Impacts

Naked milk-vetch was not found in the study area, so no direct or indirect effects are anticipated.

4.3.2.4. Compensatory Mitigation

Mitigation measures are not being proposed for this taxon because it was not found in the study area.

4.3.2.5. Cumulative Effects

Naked milk-vetch is not known to occur in the study area, so cumulative effects are not applicable.

4.3.3. Inyo County star-tulip (*Calochortus excavatus*), FSC and CNPS List 1B.

4.3.3.1. Survey Results

Inyo County star-tulip is a perennial herb in the lily family (Liliaceae). This species blooms during April and May (USFWS 1996b), but the plants may remain dormant in dry years and not produce above-ground shoots or flowers (USFWS 1996b, Paula Hubbard personal communication 2002). It is known only from Inyo and Mono counties at elevations ranging from 1,150 to 1,960 m (3,780 to 6,430 ft). Inyo County star-tulip typically grows in alkali meadows but a few occurrences are known from near seeps or springs in shadscale scrub or in irrigated pastures (Tibor 2001). At 20 of the 51 known sites, this species grows in association with Owens Valley checkerbloom (CNDDB 2002*a*). The closest documented occurrence of Inyo County star-tulip is in the Alabama Hills near Lone Pine, approximately 19 km (12 mi) north of the study area (CNDDB 2002a). According to Paula Hubbard (personal communication 2002), another local biologist claims to have seen this species approximately halfway between Cartago and Olancha, between the bottling plant and the bed of Owens Lake, but the report has not been verified.

Despite intensive surveys in the wetlands during April and June 2001, Inyo County star-tulip was not found in the project area, nor was it observed growing with the nearby populations of Owens Valley checkerbloom. However, 2001 was not a particularly favorable year for Inyo County star-tulip (Paula Hubbard personal communication 2002), and the plants may have remained dormant.

4.3.3.2. Avoidance and Minimization Efforts

All alternative alignments that would have disturbed wetlands have been rejected or modified by Caltrans. Indirect effects due to hydrological changes will be minimized because culverts will be constructed where streams cross the highway.

4.3.3.3. Project Impacts

Even if Inyo County star-tulip was present in the study area, none of the proposed alternatives would affect it because direct effects to wetland habitats are being avoided. Indirect effects due to any alternative would be minimal due to the installation of culverts where streams cross the highway.

4.3.3.4. Compensatory Mitigation

Mitigation measures are not being proposed for this species because it was not found in the study area.

4.3.3.5. Cumulative Effects

Threats to Inyo County star-tulip throughout its range include groundwater pumping, development, road maintenance, and livestock grazing (Tibor 2001). The other known project that may affect suitable habitat adjacent to the study area is Western Water Company's proposed groundwater pumping (Bagley and Leatherman 1999). Drawdown of the water table could affect future moisture availability to the wetlands because the surface soil is less likely to remain moist when the water table is far underground. Road maintenance is not a problem in the study area because this species does not occur adjacent to roads.

Livestock grazing does take place in suitable habitats in the study area. The moist areas where Inyo County star-tulip could grow are attractive to cattle because they remain green longer than the drier, upland areas. This project would not contribute to the cumulative effects because wetlands are being avoided.

4.3.4. Pygmy poppy (*Canbya candida*), CNPS List 4.

4.3.4.1. Survey Results

Pygmy poppy is an annual herb of the poppy family (Papaveraceae) that flowers between March and June. It occurs in Inyo, Kern, Los Angeles, and San Bernardino counties from approximately 600 to 1,200 m (1,970 to 3,940 ft) in elevation. Pygmy poppy grows in the Joshua tree woodland, Mohavean desert scrub, and pinyon and juniper woodland communities on sandy or granitic soils (Tibor 2001).

A large colony of pygmy poppy was observed in the Shadscale Series near the middle of the study area (Appendix A). More than 100,000 individuals of pygmy poppy were present in Spring 2001 over an area of approximately 10.5 ha (26 ac), but none were observed during follow-up surveys in Spring 2002. This does not indicate a downward trend because desert annuals such as pygmy poppy typically vary in population size depending on rainfall. In a year of average or greater rainfall, pygmy poppy could be much more widespread within the study area, and many more individuals could be present both within and outside of the alternative alignments.

CNDDB file records indicate that pygmy poppy was collected previously near Ash Creek, which is at the extreme north end of the study area (Anne Halford personal communication 2002). However, the species was not observed in that area during surveys for this project. Pygmy poppy has also been seen near Little Lake, approximately 35 km (22 mi) south of the south end of the study area (CH2MHill 2001).

4.3.4.2. Avoidance and Minimization Efforts

Effects to pygmy poppy will be minimized by the duff provision. Caltrans intends to collect duff and soil to a depth of 150 mm (6 in.), then respread them in the study area. Because pygmy poppy is an annual plant, viable seeds are likely to be present in the duff and soil wherever mature plants have occurred within the past several years. Those seeds would be salvaged when the duff and soil are collected. After the accumulated duff and soil are respread, the seeds would be expected to germinate in the next year of adequate rainfall.

4.3.4.3. Project Impacts

Alternatives 1 and 2 would not affect pygmy poppy directly. The alignments for those two alternatives are located 253 m (829 ft) and 139 m (456 ft), respectively, from the observed occupied habitat. Alternative 3 would not likely have any direct effects on pygmy poppy because the alignment is 35 m (115 ft) from the observed occupied habitat. However, it is possible that the pygmy poppy population could be more extensive in another year, and possibly could extend into the path of Alignment 3. Alternatives 2a and 3a would each affect approximately 2.3 ha (5.6 ac) of occupied pygmy poppy habitat, which is approximately 22 percent of the occupied habitat in the study area. These effects would be permanent because natural habitat would be replaced with pavement, but they would be minimized by respreading duff that is removed from the study area (see Section 4.3.4.2). Indirect effects would not occur to pygmy poppy under any of the alternatives.

4.3.4.4. Compensatory Mitigation

Due to the lack of any protected status for pygmy poppy, compensatory mitigation is not necessary and is not being proposed.

4.3.4.5. Cumulative Effects

Throughout its range, pygmy poppy is threatened by development and by competition from non-native plants (Tibor 2001). Within the study area, the only current or proposed project that may affect pygmy poppy is the Southern Zones Dust Control Project (CH2MHill 2001). The South Zonal Mainline and associated road are not too far south of Ash Creek, where pygmy poppy has been reported previously (see Section 4.3.4.1). The current status of that population is not known because pygmy poppy was not observed in that area during 2001 surveys conducted by ESRP or CH2MHill. No other projects are proposed for the more southerly population found during surveys for the Olancha/Cartago four-lane project. Thus, the only known effects on pygmy poppy due to the Highway 395 expansion project would be those discussed above in Section 4.3.4.3.

4.3.5. Sanicle cymopterus (*Cymopterus ripleyi* var. *saniculoides*), CNPS List 1B.

4.3.5.1. Survey Results

Sanicle cymopterus is a perennial herb of the carrot family (Apiaceae). This variety is lumped under Cymopterus ripleyi in the Jepson manual (Hickman 1993) but is still recognized by CNDDB (2002a) and CNPS (Tibor 2001). The typical flowering period of sanicle cymopterus is from April to May, but it may continue flowering into June in wet years. The taproot survives from year to year, but above-ground plants appear only during favorable conditions (Bagley and Leatherman 1999). In California, sanicle cymopterus is restricted to Inyo County, but it also occurs in Nevada. Sanicle cymopterus has been found at elevations ranging from 1,119 to 1,661 m (3,670 to 5,450 ft). This taxon most often grows in the Joshua tree woodland and creosote bush scrub communities (Tibor 2001, CNDDB 2002a), but in the vicinity of the study area it has been reported from the desert saltbush scrub, shadscale scrub, and greasewood communities (Bagley and Leatherman 1999). All known sites are on deep or loose, sandy soils (Tibor 2001).

The closest documented population of sanicle cympoterus is adjacent to the study area, approximately 400 m (1,300 ft) east of the existing lanes of Highway 395 near Grant (Mark Bagley personal communication 2003). More than 1,000 individuals of sanicle cymopterus were found in the population immediately east of the study area in 1998, which was a particularly wet year (Bagley and Leatherman 1999, Mark Bagley personal communication 2003). Additional, smaller colonies occurred north to the Olancha Dunes and south to the North Haiwee Dam as of 1998 (Bagley and Leatherman 1999). Most of the other known occurrences of sanicle cymopterus in California are at the base of the Coso Mountains, northeast of Haiwee Reservoir (CNDDB 2002a).

Sanicle cymopterus was not observed during surveys conducted in the Shadscale Series near Grant on May 1 and 2, 2001. However, this taxon has a high likelihood of occurring in the study area due to its close proximity and the presence of suitable habitat. It is possible that it had already gone dormant by the time of the surveys because 2001 was a rather dry year.

4.3.5.2. Avoidance and Minimization Efforts

Sanicle cymopterus was not observed in the study area, so avoidance is not applicable. Any potential effects will be minimized by the duff provision. Caltrans intends to collect and respread duff and soil to a depth of 150 mm (6 in.). Because sanicle cymopterus is an annual plant, viable seeds are likely to be present in the duff and soil wherever mature plants have occurred within the past several years. Thus, even though mature plants were not observed during surveys, if seeds from previous years were present, they would be salvaged. After the accumulated duff and soil are respread within the study area, the seeds would be expected to germinate in the next year of adequate rainfall.

4.3.5.3. Project Impacts

Alternatives 1, 3, and 3a would not affect sanicle cymopterus directly or indirectly. Direct effects to sanicle cymopterus are possible from Alternatives 2 or 2a, but the amount of occupied habitat that would be lost cannot be quantified unless sanicle cymopterus is actually observed in the study area. These effects would be permanent because natural habitat would be replaced with pavement, but they would be minimized by respreading duff that is removed from the study area (see Section 4.3.5.2). Indirect effects are not anticipated from any of the alternatives. The previously-reported population of sanicle cymopterus outside of the study area would not be affected directly or indirectly by the proposed project because the closest alignments are 283 m (929 ft) away from its boundaries.

4.3.5.4. Compensatory Mitigation

Mitigation measures are not being proposed for this taxon because it was not found in the study area.

4.3.5.5. Cumulative Effects

Sanicle cymopterus is threatened by livestock grazing at one site on BLM land (Tibor 2001). The only current or future project that may affect the taxon in the study area is the proposed groundwater pumping project near Olancha. The effect would not be due to changes in groundwater, but rather to installation of the pumping stations. Exact locations of pumping stations are unknown (Bagley and Leatherman 1999).

4.3.6. Sagebrush-like loeflingia (*Loeflingia squarrosa* var. *artemisiarum*), CNPS List 2.

4.3.6.1. Survey Results

Sagebrush-like loeflingia is an annual member of the pink family (Caryophyllaceae). It flowers during April and May. This taxon occurs in Inyo, Kern, Lassen, and Los Angeles counties as well as in Nevada, Oregon, and Wyoming. In California, sagebrush-like loeflingia is found at elevations ranging from approximately 700 to 1,615 m (2,300 to 5,300 ft). It typically grows in sandy soils, often in association with greasewood on the margins of clay slicks. This taxon is known from the Great Basin scrub, Sonoran desert scrub, and dune communities (Tibor 2001, CNDDB 2002a).

The Big Sagebrush Series and Greasewood Series communities were surveyed from April 26 to May 2, 2001. The Greasewood Series was surveyed a second time on May 2, 2002. No individuals of sagebrush-like loeflingia were observed during the surveys. Clay slicks are not present in the study area, although sandy areas do occur. As with the other annuals, this taxon may not have germinated during 2001 and 2002 due to dry weather. The closest known locality for sagebrush-like loeflingia is south of Tinemaha Reservoir, approximately 76 km (47 mi) north of the northern limit of this project. Due to the marginal habitat and distance from known populations, sagebrush-like loeflingia has a low probability of occurrence in the study area.

4.3.6.2. Avoidance and Minimization Efforts

Sagebrush-like loeflingia was not observed in the study area, so avoidance is not applicable. Any potential effects will be minimized by the duff provision. Caltrans intends to collect and respread duff and soil to a depth of 150 mm (6 in.). Because sagebrush-like loeflingia is an annual plant, viable seeds are likely to be present in the duff and soil wherever mature plants have occurred within the past several years. Thus, even though mature plants were not observed during surveys, if seeds from previous years were present, they would be salvaged. After the accumulated duff and soil are respread within the study area, the seeds would be expected to germinate in the next year of adequate rainfall.

4.3.6.3. Project Impacts

None of the project alternatives are expected to affect sagebrush-like loeflingia because it is not known to occur in the study area.

4.3.6.4. Compensatory Mitigation

Mitigation measures are not being proposed for this taxon because it was not found in the study area.

4.3.6.5. Cumulative Effects

Sagebrush-like loeflingia is not known to occur in the study area, so cumulative effects are not applicable.

4.3.7. Coso Mountains lupine (*Lupinus magnificus* var. *glarecola*), CNPS List 4.

4.3.7.1. Survey Results

Coso Mountains lupine is a perennial herb in the pea family. This variety is lumped under Lupinus magnificus in the Jepson manual (Hickman 1993) but is still recognized by CNDDB (2002a) and CNPS (Tibor 2001). Coso Mountains lupine blooms from April to June, but flowers appear only after a fire. It is known from elevations of approximately 1,110 to 2,440 m (3,640 to 8,005 ft) in Inyo and San Bernardino counties. Coso Mountains lupine grows on loose, rocky slopes such as talus in Great Basin scrub, Mohave desert scrub, and Joshua tree woodland (Tibor 2001).

This taxon was not observed during the botanical surveys, which were conducted during the early part of its reported flowering period. Even if Coso Mountains lupine was present, detection would be difficult because there is no evidence of recent fires in the study area, and this taxon would not likely be in flower. However, the lack of loose, rocky slopes in the study area suggests that Coso Mountains lupine has a low probability of occurrence. The closest specified location of Coso Mountains lupine is in the Sierran foothills west of Independence (DeDecker 1974, CalFlora 2002), more than 50 kilometers (30 miles) northwest of the study area. Other populations in the Coso Mountains may be closer because the Coso Mountains begin approximately 4 km (2.5 miles) east of the project boundary, but exact locations for this taxon are not provided by CNDDB (2002a).

4.3.7.2. Avoidance and Minimization Efforts

Avoidance and minimization efforts are not necessary because this taxon is not known to occur in the study area.

4.3.7.3. Project Impacts

Coso Mountains lupine was not found in the study area, so no effects are anticipatedfor any alternative.

4.3.7.4. Compensatory Mitigation

Mitigation measures are not being proposed for this taxon because it was not found in the study area.

4.3.7.5. Cumulative Effects

Coso Mountains lupine is not known to occur in the study area, so cumulative effects are not applicable.

4.3.8. Crowned muilla (*Muilla coronata*), FSC and CNPS List 4.

4.3.8.1. Survey Results

Crowned muilla is a perennial herb of the lily family. The corm (a swollen, underground stem) sends up new shoots each year, which produce blooms during March and April. Crowned muilla is known from Inyo, Kern, Los Angeles, San Bernardino, and Tulare counties. It grows at at elevations of approximately 1,000 to 1,600 m (3,280 to 5,250 ft). Crowned muilla can be found in a number of plant communities, including Joshua tree woodland, Mohave desert scrub, and pinyon-juniper woodland (Tibor 2001).

Within the study area, six individual plants were found that could possibly be crowned muilla. The plants were obviously members of the lily family, but they were well past blooming and had desiccated by the time they were discovered in 2001. These plants occurred in sandy areas of the Shadscale Series community at the west side of the study area (Appendix A). Follow-up surveys were attempted repeatedly in that area during 2002, but the putative crowned muilla plants were not seen. Perennial plants such as crowned muilla do not always send up above-ground shoots during dry years, so the absence of these plants in 2002 is not a cause for concern. It is quite possible that many more than six plants will appear in the next year of average or above-average rainfall. Throughout this report, the plants will be referred to as crowned muilla even though the identity is not absolutely certain.

Specific locations of crowned muilla are not documented by the CNDDB (2002a) or CNPS (Tibor 2001) but Anne Halford (personal communication 2002) believes that the species could occur in the study area. Collection notes from the late botanist Mary DeDecker indicate that she found crowned muilla north and southwest of Independence, with the closest observation approximately 48 km (30 mi) north of the project boundary (Anne Halford personal communication 2002).

4.3.8.2. Avoidance and Minimization Efforts

The crowned muilla plants are more than 300 m (more than 1,000 ft) away from the closest alignment. Thus, no avoidance or minimization efforts are necessary.

4.3.8.3. Project Impacts

None of the project alternatives will affect crowned muilla directly or indirectly. Alternative 1 is at least 1,143 m (3,750 ft) from the eastern margin of the occupied habitat. Alternative 2 is approximately 1,000 m (3,280 ft) from the crowned muilla, whereas Alternative 2a approaches within approximately 789 m (2,589 ft). The closest alignments are Alternatives 3 and 3a, which are both approximately 327 m (1,072 ft) away from the boundaries of the observed crowned muilla population.

4.3.8.4. Compensatory Mitigation

Compensation is not being proposed for crowned muilla because all alternatives bypass the population by a large margin.

4.3.8.5. Cumulative Effects

No other surface-disturbing actions are known to be occurring or proposed in the crowned muilla habitat in the study area.

4.3.9. Nevada oryctes (*Oryctes nevadensis*), FSC , CNPS List 2.

4.3.9.1. Survey Results

Nevada oryctes is an annual herb in the nightshade family (Solanaceae). It blooms from April to June. In California, Nevada oryctes is known only from the Owens Valley in Inyo County; it also occurs in Nevada, where it is on a watch list. The elevation range of known locations in California is from 1,100 to 2,535 m (3,600 to 8,300 ft). Nevada oryctes grows in loose, sandy soils of washes and dunes in the Mohave desert scrub and saltbush scrub communities (Tibor 2001).

Nevada oryctes was not found during vegetation surveys, even though they were conducted during April. It is possible that seeds are present but did not germinate due to the dry weather during the growing season in which surveys were conducted. However, Bagley and Leatherman (1999) did not find this species in loose, sandy soils east of the study area when they surveyed during the favorable growing conditions of 1998. The soils in that area south of Owens Lake are more suitable for this species than the soils within the study area. The southernmost documented locality is southeast of Lone Pine, approximately 20 km (12 mi) to the northeast (CNDDB 2002a). Given the fact that Bagley and Leatherman did not find this species during their surveys, Nevada oryctes is probably not present in the study area.

4.3.9.2. Avoidance and Minimization Efforts

Nevada oryctes was not observed in the study area, so avoidance is not applicable. Any potential effects will be minimized by the duff provision. Caltrans intends to collect and respread duff and soil to a depth of 150 mm (6 in.). Because Nevada oryctes is an annual plant, viable seeds are likely to be present in the duff and soil wherever mature plants have occurred within the past several years. Thus, even though mature plants were not observed during surveys, if seeds from previous years were present, they would be salvaged. After the accumulated duff and soil are respread within the study area, the seeds would be expected to germinate in the next year of adequate rainfall.

4.3.9.3. Project Impacts

Nevada oryctes was not found in the study area, so no effects are anticipated.

4.3.9.4. Compensatory Mitigation

Mitigation measures are not being proposed for this species because it was not found in the study area.

4.3.9.5. Cumulative Effects

Nevada oryctes is not known to occur in the study area, so cumulative effects are not applicable.

4.3.10. Inyo phacelia (*Phacelia inyoensis*), CNPS List 1B.

4.3.10.1. Survey Results

Inyo phacelia is an annual herb and a member of the waterleaf family (Hydrophyllaceae). Flowers can be found from April to August; plants at higher elevations bloom later than those at lower elevations. This species is found in Inyo and Mono counties at elevations ranging from of approximately 915 to 3,200 m (3,000 to 10,500 ft). Inyo phacelia grows in alkali meadows, seeps (Tibor 2001), and in the transition zone between alkali meadow and scrub habitats (Anne Halford personal communication 2002).

This species was not observed during the surveys. As with the other annuals, Inyo phacelia seeds could possibly be present, but seedlings may not have matured due to unfavorable growing conditions during the survey period. The closest occurrence is in the Alabama Hills, approximately 19 km (12 mi) north of the study area (Bagley and Leatherman 1999, CH2MHill 2001).

4.3.10.2. Avoidance and Minimization Efforts

Caltrans has avoided direct effects to Inyo phacelia by eliminating all project alternatives that would have disturbed wetlands. Any potential indirect effects to local hydrology will be minimized by the installation of culverts.

4.3.10.3. Project Impacts

Inyo phacelia will not be affected directly or indirectly by this project because wetland habitats and the hydrologic regime are not being affected or altered by any of the action alternatives.

4.3.10.4. Compensatory Mitigation

Mitigation measures are not being proposed for this species because it was not found in the study area.

4.3.10.5. Cumulative Effects

Inyo phacelia is not known to occur in the study area, so cumulative effects are not applicable.

4.3.11. Charlotte's phacelia (*Phacelia nashiana*), FSC and CNPS List 1B.

4.3.11.1 Survey Results

Charlotte's phacelia is an annual herb in the waterleaf family. It flowers between March and June. This species has been reported from Inyo, Kern, and Tulare counties at elevations ranging from 610 to 2,195 m (2,000 to 7,200 ft). It is most often found in creosote bush scrub but also occurs in the Joshua tree woodland and pinyon-juniper communities. Charlotte's phacelia grows on sandy, gravelly, or volcanic ash soils, often on steep slopes (Tibor 2001, CNDDB 2002a).

No individuals of Charlotte's phacelia were observed in the study area despite surveys conducted in the appropriate habitats during late April and early May 2001. The closest occurrence of Charlotte's phacelia is on the Haiwee Pass quadrangle, approximately 13 km (8 mi) to the southwest of the southern limit of the project. However, this species has never been found in the Owens Valley proper (DeDecker 1974, CNDDB 2002a, Clifton no date).

4.3.11.2. Avoidance and Minimization Efforts

Charlotte's phacelia was not observed in the study area, so avoidance is not applicable. Any potential effects will be minimized by the duff provision. Caltrans intends to collect and respread duff and soil to a depth of 150 mm (6 in.). Because Charlotte's phacelia is an annual plant, viable seeds are likely to be present in the duff and soil wherever mature plants have occurred within the past several years. Thus, even though plants were not observed during surveys, if seeds from previous years were present, they would be salvaged. After the accumulated duff and soil are respread within the study area, the seeds would be expected to germinate in the next year of adequate rainfall.

4.3.11.3. Project Impacts

Charlotte's phacelia was not found in the study area, so no effects are anticipated.

4.3.11.4. Compensatory Mitigation

Mitigation measures are not being proposed for this species because it was not found in the study area.

4.3.11.5. Cumulative Effects

Charlotte's phacelia is not known to occur in the study area, so cumulative effects are not applicable.

4.3.12. Parish's popcorn-flower (*Plagiobothrys parishii*), CNPS List 1B.

4.3.12.1. Survey Results

Parish's popcorn-flower is an annual herb in the borage family (Boraginaceae). The primary flowering period is from April to June (Munz and Keck 1959, Baldwin et al. 2002), but plants have been found in flower any time between March and November (Tibor 2001). This species was known historically from Inyo, Los Angeles, Mono, and San Bernardino counties, but in recent years it has been documented only at a single site in San Bernardino County. Parish's popcorn-flower has been reported from elevations of approximately 750 to 1,400 m (2,460 to 4,600 ft). This species grows in moist, alkaline areas within shadscale scrub (DeDecker 1974), sagebrush scrub, and Joshua tree woodland communities (Tibor 2001).

In 2001, a few hundred plants believed to be Parish's popcorn-flower were found just east of the study area on the margins of a small, alkaline wetland, possibly a seep. During follow-up surveys in early May 2002, the population covered an extensive area of the Saltgrass Series and Bulrush Series along the margin of Owens Lake (Appendix A). At that time, the population of Parish's popcorn-flower was estimated to include millions of plants. The enormous population increase despite lower total rainfall was apparently due to leakage from a pipeline that was installed to provide water for dust control efforts farther east on the lake bed. The Parish's popcorn-flower nutlets ("seeds") must have been present for years waiting for appropriate conditions to germinate, because the small population observed in 2001 is unlikely to have produced a large enough crop of nutlets to generate such a huge population. In 2002, Parish's popcorn-flower was growing among saltgrass, Baltic rush, sedges, and the invasive, non-native plant five-horn bassia.

Parish's popcorn-flower has been collected twice before in Inyo County, in 1942 and 1978. The first collection was from an alkali seep in Tuttle Creek Canyon southwest of Lone Pine, approximately 24 km (15 mi) northwest of the study area. The second collection was recorded north of Big Pine, approximately 100 km (60 mi) north of the study area (CalFlora 2003).

Species experts disagree as to the identity of the plants discovered adjacent to the study area. Mr. Tim Messick (personal communication 2002), who wrote the chapter on Plagiobothrys for the Jepson Manual, supports the identification of the plants as Parish's popcorn-flower. Dr. Dean Taylor (personal communication 2003), believes that the plants he collected near

Big Pine in 1978 were Parish's popcorn-flower, and he confirmed that the growth form was similar to those ESRP found near the study area. Both checklists of the flora of the Owens Valley (DeDecker 1974, Clifton no date) include Parish's popcorn-flower, although Clifton (no date) uses the name Allocarya cooperi to refer to this species. However, Mr. Tim Thomas (personal communication 2002), who is familiar with the population in San Bernardino County, believes that the plants may be an undescribed species. Dr. Ron Kelley (personal communication 2003), the national authority on the genus Plagiobothrys, agrees that the plants are either Parish's popcorn-flower or an undescribed taxon. However, Dr. Kelley cannot be certain without seeing the plants in the field.

Throughout this report, this population will be referred to as Parish's popcorn-flower even though the identity is not absolutely certain. Even if it is an undescribed species, the Plagiobothrys population ESRP discovered adjacent to the study area is an extremely rare plant. The other Inyo County collections probably represent the same species, but their current status is unknown.

Although Parish's popcorn-flower was not found within the study area boundaries, there is a slight possibility that it could occur in other patches of the Saltgrass Series or in the Bulrush Series. Parish's popcorn-flower adjacent to the study area was very conspicuous in May 2002 and was easily visible from the highway due to the large expanses of white flowers. Similar displays were not observed elsewhere in or near the study area. However, seeds of this species may be present in these habitats but may germinate only if wetter conditions occur.

4.3.12.2. Avoidance and Minimization Efforts

Caltrans designed the alternatives to avoid direct effects to all wetland habitats, including the habitat of Parish's popcorn-flower. Indirect effects due to hydrological changes will be minimized because culverts will be constructed where streams cross the highway.

4.3.12.3. Project Impacts

None of the proposed alternatives would have direct effects on Parish's popcorn-flower because all alignments are at least 140 m (459 ft) away from the occupied habitat. Indirect hydrological effects could occur if the water flow from upslope was reduced. However, such effects will be minimized by the installation of culverts beneath the highway at all stream crossings. Other indirect effects are possible due to road runoff. Small amounts of contaminants such as oil may leak from passing vehicles onto the highway and be washed into the wetlands during storm events. Although this runoff would be periodic, the effect would be permanent because it would occur throughout the life of the highway. However, the amount of runoff reaching the Parish's popcorn-flower habitat will not likely be any greater than that currently experienced because the new lanes of the highway would be separated from the existing lanes by a median at least 24.4 meters (80 feet) wide. The upland plant communities of the median would filter out contaminated runoff. Pollutants that were deposited in the stream channels might have a somewhat greater chance of reaching the wetlands bordering the lake, but this is unlikely to affect the wetlands greatly.

4.3.12.4. Compensatory Mitigation

Mitigation measures are not being proposed for this species because it will not be affected by this project.

4.3.12.5. Cumulative Effects

Immediately east of the study area, Parish's popcorn-flower is already being affected by the Owens Lake Southern Zones Dust Control Project (CH2MHill 2001). The Parish's popcorn-flower population truncates abruptly on its northern and eastern sides where the South Zonal Mainline is being installed to carry water to Owens Lake for dust control. It is not known how much farther east the population might have extended in the absence of the pipeline berm. Currently, drier conditions associated with slight increases in elevation appear to be limiting the extent of the population at its southern and western ends.

Despite obvious negative effects of the South Zonal Mainline, activities associated with the dust control project apparently have created favorable conditions for Parish's popcorn-flower, at least temporarily. This species occupied hundreds of times more habitat in Spring 2002 than in Spring 2001. This is unexpected given that the area that is slated to received water from the dust control project is considerably farther east in the lake bed (CH2MHill 2001). Apparently some additional water was inadvertently released from the Los Angeles Aqueduct when a new spillgate and 1.5-m (60-in.) pipeline were installed to connect to the South Zonal Mainline. If no additional releases of water occur in this area, habitat moisture will likely return to a condition more similar to that seen in 2001.

The only other known project that may affect the Parish's popcorn-flower habitat adjacent to the study area is Western Water Company's proposed groundwater pumping (Bagley and Leatherman 1999). The proposed groundwater pumping would occur south of Cartago, but drawdown of the water table could affect moisture availability to the Parish's popcorn-flower population.

Ongoing livestock grazing in the area most likely reduced the size of the Parish's popcorn-flower population. The moist areas where this species grows are attractive to livestock because they remain green longer than the more upland areas. ESRP biologists observed damage to Parish's popcorn-flower due to livestock herbivory during Spring 2002. However, effects of cattle are independent of the proposed project and may be reversible if livestock grazing is reduced or eliminated.

The proposed highway expansion would not contribute to the cumulative hydrological effects or destroy any habitat for Parish's popcorn-flower.

4.3.13. Owens Valley checkerbloom (*Sidalcea covillei*), FSC, SE, CNPS List 1B.

4.3.13.1. Survey Results

Owens Valley checkerbloom is a perennial herb of the mallow family (Malvaceae). It blooms from April to June. This species is endemic to the Inyo County portion of the Owens Valley. Owens Valley checkerbloom occurs at elevations ranging from 1,097 to 1,417 m (3,600 to 4,650 ft). Most reported occurrences are in alkali meadows, but a few are in irrigated pastures and one is on a dry slope near a spring. Owens Valley checkerbloom typically grows in fine sandy loam soil but is known from stony calcareous soil at one site (CNDDB 2002a). This species needs moist soil, although a fleshy root allows it to survive during periods of low rainfall (USFWS 1996b).

Two of the Owens Valley checkerbloom occurrences (#35 and #37) cataloged by the California Natural Diversity Data Base (2002a) are immediately adjacent to the study area, in wetlands on the edge of the Owens Lake bed (Appendix A). All wetlands in the study area were searched carefully for this species in April or May 2001, with particular attention paid to the vicinity of the known occurrences.

Owens Valley checkerbloom was not observed within the study area, but ESRP biologists discovered a previously unreported population during surveys for the Olancha/Cartago four-lane project in 2001. The newly discovered population was east of the study area boundary, northeast of Cartago. At least 200 Owens Valley checkerbloom plants were observed. It is possible that additional, inconspicuous plants were present because the blooms had already faded by that time; a larger population estimate might be obtained in a wetter year. This population was growing in the transition zone between the Saltgrass Series and the Bulrush Series. It occupied a narrow zone where the slope approaches the edge of the alkaline Owens Lake bed. Dominant species in the occupied habitat were saltgrass, Baltic rush, and yerba mansa.

Due to the presence of suitable habitat and the proximity of the known occurrences, Owens Valley checkerbloom has a high likelihood of occurring in the study area. However, this species would not be expected within the project area because none of the alternatives affect wetland habitats.

4.3.13.2. Avoidance and Minimization Efforts

Caltrans designed the alternatives to avoid direct effects to all wetland habitats, which are habitat for the Owens Valley checkerbloom. Indirect effects due to hydrological changes will be minimized because culverts will be constructed where streams cross the highway.

4.3.13.3. Project Impacts

Direct effects to Owens Valley checkerbloom will not occur because none of the alignments pass through the known populations; aall alignments are at least 206 m (675 ft) away from the known occupied habitat. However, indirect effects could occur if local water flow was altered during construction or operation of the highway. All of the alternative alignments for this project are upslope of the Owens Valley checkerbloom populations. Thus, any diversion of water by the highway could eventually reduce the amount of overland water flow reaching the populations. If this occurred, moisture levels in the Owens Valley checkerbloom habitat would decrease over time, probably leading to a slow decline in the population. These indirect effects will be minimized by installing culverts. Another potential indirect effect could come from highway runoff, but it is not expected to be greater than current runoff (see Parish's popcorn-flower for more discussion).

4.3.13.4. Compensatory Mitigation

Mitigation measures are not necessary because the wetland habitat for Owens Valley checkerbloom will not be affected.

4.3.13.5. Cumulative Effects

The other known project that may affect the Owens Valley checkerbloom habitat adjacent to the study area is Western Water Company's proposed groundwater pumping (Bagley and Leatherman 1999). Drawdown of the water table could affect future moisture availability to the Owens Valley checkerbloom habitat north of Cartago because the surface soil is less likely to remain moist when the water table is far underground (see section 4.2.3.5 for details on groundwater levels in the study area). The groundwater pumping project is unlikely to affect the two known populations south of Cartago because they are in pastures where supplemental watering would provide surface moisture.

Although CNPS cites livestock grazing as a potential threat (Tibor 2001), the recovery plan for Owens Valley checkerbloom (USFWS 1996*b*) indicates that it is not affected by livestock grazing.

4.3.14. Alkali cord grass (*Spartina gracilis*), CNPS List 4.

4.3.14.1. Survey Results

Alkali cord grass is a perennial herb of the grass family (Poaceae). It flowers from June to August. Although the individual flowers are inconspicuous, the entire flower stalk is more noticeable. In California, this species occurs only in Inyo and Mono counties, but it ranges northward into Oregon and eastward as far as the Great Plains and eastern Canada. In California, it is found at elevations ranging from approximately 1,000 to 2,100 m (3,280 to 6,890 ft) on moist, alkaline soils in meadows, marshes, and within Great Basin scrub communities (Tibor 2001).

Alkali cord grass was not observed within the study area boundaries or in the adjacent areas. Surveys were conducted in suitable habitats during both April and June 2001 because this species is inconspicuous unless it is in flower, but alkali cord grass was not found. Several occurrences are known in close proximity to the study area, from the south end of Owens Lake almost to the western margin of the Olancha Dunes (Bagley and Leatherman 1999). The closest occurrence is at least 270 m (888 ft) away from the eastern boundary of the study area (Appendix A). This species most likely would have been observed during project surveys if it had been present.

4.3.14.2. Avoidance and Minimization Efforts

Avoidance and minimization efforts are not necessary because alkali cord grass was not found in the study area.

4.3.14.3. Project Impacts

Effects are not anticipated because alkali cord grass was not found within or immediately adjacent to the study area.

4.3.14.4. Compensatory Mitigation

Mitigation measures are not being proposed for this species because it was not found in the study area.

4.3.14.5. Cumulative Effects

Alkali cord grass is not known to occur in the study area, so cumulative effects are not applicable.

4.4. Special Status Animal Species Occurrences

The analysis in this section addresses sixteen special-status wildife species observed within the project area, known to occur within the project area, or those that have the potential to occur within the project area based on the presence of suitable habitat. (Table 7). They are discussed below in taxonomic order.

4.4.1. Discussion of Alkali Skipper (*Pseudocopaeodes eunus*) FSC

4.4.1.1. Survey Results

The alkali skipper is a butterfly that is found mainly in alkaline meadows where its host plant, saltgrass, is present. No surveys were conducted specifically to detect this species, but it has been reported in several areas around Owens Lake (Bagley and Leatherman 1999). The Saltgrass Series occurs east of Highway 395, from Highway 190 northward (Figure 7) and it may be expected that the alkali skipper occurs there.

4.4.1.2. Avoidance and Minimization Efforts

Caltrans designed all the the alternatives to avoid effects to all wetland habitats, including the Saltgrass Series. Hydrological changes will be minimized because culverts will be installed where streams cross the highway.

4.4.1.3. Project Impacts

Direct effects to wetlands are being avoided. Indirect hydrological effects will not occur because culverts will be installed where streams cross the highway

4.4.1.4. Compensatory Mitigation

Compensatory mitigation is not required because all wetlands including the Saltgrass Series in the study area are being avoided.

4.4.1.5. Cumulative Effects

Current and future projects that might affect wetlands in the study area are the ongoing Southern Zones Dust Control Project (CH2MHill 2001) and Western Water Company's proposed groundwater pumping (Bagley and Leatherman 1999). To date, the Southern Zones Dust Control Project has apparently had a positive, indirect effect on wetlands by increasing available moisture to the plant communities near Willow Dip. Most of the hydrological changes due to that project will occur far out in the lake bed and the water will come from the existing Los Angeles Aqueduct. Direct disturbance to wetlands in the study area is not anticipated by the Southern Zones Dust Control Project. Drawdown of the water table as a result of the proposed groundwater pumping could affect moisture availability to the wetlands. However, the wetland vegetation is flood irrigated or supplementally watered with sprinklers or flood irrigated , so drawdown may not have a great effect. The Olancha/Cartago four-lane project would not contribute to these cumulative effects because it will avoid direct effects to wetlands and minimize indirect effects.

4.4.2. Discussion of Desert Tortoise FT, ST

4.4.2.1. Survey results

The study area was surveyed in June 2001. No tortoises or tortoise sign were observed during surveys. Several additional factors support the conclusion that there are no tortoises in the area. The project site occurs at the extreme northern geographic range of the desert tortoise (Stebbins 1985). The elevation, approximately 1,158 m (3800 ft), is near the upper limit for tortoises at any latitude (Karl 1983). Plant species such as big sabebrush suggest that the area experiences colder winters than are typically preferred by desert tortoises. This combination of factors strongly suggests that the project site is outside of the northern limit of tortoises in this region.

In addition to these habitat factors, the high-impact disturbances on the project site would severely reduce tortoise densities if tortoises were present. Several studies (Nicholson 1978, Karl 1989, Boarman 1992, LaRue 1993) strongly support the concept that heavily traveled roads are mortality sinks for tortoises. Highway 395 would probably have nearly eliminated any tortoises in the immediate vicinity of the highway. The Los Angeles aqueduct would also have isolated populations on either side of it. Finally, local residences would have resulted in losses of individual tortoises to dogs, children, vehicles, grading, etc., as well as habitat loss and fragmentation.

Several previous tortoise surveys near the project area have produced no evidence of tortoises in the project vicinity. Surveys conducted by BLM in the late 1970s sampled sites in the project vicinity and to the north but did not report tortoise sign north of approximately Ridgecrest (Berry and Nicholson 1984). Karl (1984) sampled sites along the LADWP transmission line extending through the Owens Valley and did not observe tortoise sign as far north as the project site. The BLM conducted tortoise surveys for the West Mohave Plan in 1998 and 1999, halting surveys approximately 13 km (8 mi) south of the project; the nearest tortoise sign was observed 16 km (10 mi) south of the project (BLM 1999).

The project site is "uncategorized" by the BLM; the nearest categorized habitat is approximately 29 km (18 mi) south, listed as Category 3 (USDI BLM 1988). Category 3 habitat areas are not considered essential to maintenance of viable populations, are thought to have low- to medium-density populations isolated from higher-density populations, and have unresolvable conflicts. Compensation for land disturbed in Category 1 and 2 habitats is based on a formula that includes several variables and cannot exceed 6:1; compensation for Category 3 habitats is always 1:1 (USDI and CDFG 1992).

The area surveyed in June 2001 is within the West Mohave Planning Area, but is not specifically designated as a desert tortoise management area (USDI BLM 2000).

Beth Porter, a local resident, reported seeing and photographing an adult desert tortoise along Walker Canyon road just south of Olancha on 28 and 29 February 2001, and provided photographs of it. These photographs were examined by Ms. Denyse Racine, wildlife biologist, CDFG, and Dr. Alice Karl. Adrienne Disbrow, wildlife biologist, CDFG, and Wendy Philpott of Caltrans visited the location on 16 July 2002. Based on the animal's large size and apparent old age, the absence of tortoises or tortoise sign in the area, and knowledge of tortoise habitat requirements, both agreed that the animal was likely an escaped captive tortoise, and that areas north of Highway 395 where the LA Aqueduct crosses are not likely suitable for the desert tortoise.

4.4.2.2. Avoidance and Minimization Efforts

Because there is a chance that an escaped captive tortoise could be within the project area, before any construction activity starts, the contractor shall furnish a qualified biologist, who will be responsible for overseeing compliance with Contract Special Provisions as stated below. The following will be included in the Contract Special Provision for protection of desert tortoise from the 190/395 junction south to the end of the project at KP 49.5 (PM 30.8).

The qualified biologist(s) shall be responsible to see that all persons employed on the construction project shall receive instruction regarding the desert tortoise prior to performing on-site work. Instruction shall include the importance of the desert tortoise to the environment, recovery efforts for the desert tortoise, implications of the Endangered Species Act, and the importance of following all terms and conditions provided in the biological opinion. Employees shall be notified that they are not authorized to handle or otherwise move desert tortoises encountered on the project site. An education program that has been previously approved by the USFWS may be used to satisfy this term and condition, provided the project-specific mitigation measures are fully discussed. Only biologists authorized by the USFWS and CDFG shall handle desert tortoises. Caltrans shall submit the names(s) of the proposed authorized biologist(s) to the Service for review and approval at least 15 days prior to the onset of activities. No construction activities shall begin until an authorized biologist is approved.

The authorized desert tortoise biologist shall monitor installation of the temporary fence. Two types of material can be used to construct the temporary fence: 1) Plastic diamond mesh, install a minimum of 18 inches above ground and fold the bottom of the mesh toward the habitat side of the barrier and away from the highway then backfill; 2) Install temporary linear sediment barrier (Type silt fence), minimum 18 inches above ground and bury material minimum 6 inches below ground.

After installation, the qualified biologist(s) shall conduct 100% coverage clearance surveys and regularly inspect the fence to ensure its integrity. Any repairs to the fence shall be made immediately.

The project area from the 190/395 junction south shall be surveyed for desert tortoises by the authorized biologist after installation of the fence and within seven days prior to the start of any further construction activities. Desert tortoise burrows within the project limits shall be excavated by hand either by or under the direct supervision of the authorized biologist, and collapsed to prevent reentry. All desert tortoises found shall be removed from within the fenced area or placed outside of the construction corridor. If the removal is during the season of above-ground activity, the desert tortoises shall be placed beside a nearby burrow of appropriate size. If the removal is not in the season of above-ground activity, the desert tortoise shall be moved (dug out of burrow, if necessary) on a seasonably warm day and placed at the mouth of a nearby burrow of appropriate size. If the desert tortoise does not enter the burrow, an artificial burrow may be constructed and the desert tortoise placed within it. The authorized biologist shall be allowed some judgment and discretion to ensure that survival of the desert tortoise is likely.

If desert tortoises are encountered above ground during construction, the desert tortoise shall be moved out of the construction corridor, placed under a shrub in the direction it was traveling. In general, desert tortoises should be moved the minimum distance possible to ensure their safety. If desert tortoises need to be moved at a time of the day when ambient temperatures could harm them (i.e. extremely low [less than 40^{o}F] or high [greater than 90^{o}F] temperatures), they shall be held overnight in a clean cardboard box. These desert tortoises shall be kept in the care of the authorized biologist under appropriate controlled temperatures and released the next day when temperatures are favorable. All cardboard boxes shall be properly discarded after one use.

Desert tortoises moved from within fenced sites shall be marked for future identification. An identification number using the acrylic paint/epoxy covering technique shall be placed on the fourth left costar scute (Fish and Wildlife Service 1990). 35-mm slide photographs of the carapace, plastron, and the fourth costar scute shall be taken. No notching is authorized.

Desert tortoises shall be handled only by the authorized biologist and only when necessary. New latex gloves shall be used when handling each desert tortoise to avoid the transfer of infectious diseases between animals.

The authorized biologist(s) shall follow the General handling Protocol sections of the "Protocols for Handling Live tortoises" (Arizona Game and Fish Department et al. 1991).

There will not be any replacement of lost fluids in any desert tortoise with a syringe.

If it is necessary for a worker to park temporarily outside of the fenced enclosures, the worker shall inspect for desert tortoises under the vehicle prior to moving it. If a desert tortoise is present, the worker shall carefully move the vehicle only when necessary and when the desert tortoise would not be injured by moving the vehicle or shall wait for the desert tortoise to move out from under the vehicle. The authorized biologist may also be contacted to remove the desert tortoise.

The authorized biologist shall maintain a record of all desert tortoises handled. This information shall include for each desert tortoise:

1. The locations (narrative and maps) and dates of observations,
2. General condition and health, including signs of diseases, injuries and state healing, and whether animals voided their bladders,
3. Location moved from and location moved to,
4. Diagnostic markings (e.g., identification numbers or marked lateral scutes), and
5. Slide photograph of each handled desert tortoise as described in term and condition 5.

No later than 90 days after the completion of construction or termination of exploration activities, authorized biologist(s) shall prepare a report for Caltrans, which will be forwarded to the USFWS and CDFG. The report shall document the effectiveness and practicality of the mitigation measures, the number of desert tortoises excavated from burrows, the number of desert tortoises moved from the site, the number of desert tortoises killed or injured, and the specific information for each desert tortoise as described in measure 1 and 2 above The report shall make recommendations for modifying the stipulations to enhance desert tortoise protection or to make it more workable for the contractor. Upon locating dead or injured desert tortoises, initial notification must be made within three working days of the finding first to the Engineer, then to the USFWS Division of Law Enforcement in Torrance at (310) 297-0062. The USFWS Ventura field Office shall also be notified at (805) 644-1766. Written notification to both offices must be made within five calendar days and include the date, time, and location of the carcass, a photograph, and any other pertinent information. Care must be taken in handling sick or injured animals to ensure effective treatment and in handling dead specimens to preserve biological material in the best possible state. Caltrans shall endeavor to place the remains of intact desert tortoises with educational or research institutions holding the appropriate State and Federal permit per their instructions. If such institutions are not available or the shell has been damaged, the information noted above shall be obtained and the carcass left in place. Caltrans should consider marking the carcass in a manner that would not be toxic to other wildlife to ensure that it would not be re-recorded in the future.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution by Caltrans through a biologist prior to implementation of the action. Injured animals shall be transported to a qualified veterinarian. Should any treated desert tortoises survive, the USFWS shall be contacted regarding the final disposition of the animals.

The Contractor shall also conform to the following requirements and shall conduct his work accordingly.

- Wrappers, food scraps, cans, bottles, etc. must be disposed of in a closed trash container or removed from the site.
- Do not travel or place materials or equipment outside the designated construction areas.
- Report any tortoise sighted to the Engineer. Sightings must be quickly reported and any work that may harm the tortoise shall be stopped until it is removed by the approved biologist.
- Do not touch, harass, collect, or otherwise harm tortoises.
- If, during construction, the contractor discovers a desert tortoise, the Contractor shall protect it and immediately notify the Engineer. Work shall be stopped in the immediate area until the approved biologist can move the tortoise safely.
- If, during construction a Desert Tortoise is harmed or killed, the Contractor shall immediately notify the Engineer. Work shall be stopped in the immediate area until the approved biologist can remove the injured or dead tortoise.
- Full compensation for conforming to the requirements of this section, including furnishing the biologist, shall be considered as included in the contract prices paid for the various work and no additional compensation will be allowed.

4.4.2.3. Project Impacts

No direct effects are expected to occur from any alternative because the Contract Special Provisions will eliminate the chance that an escaped captive tortoise will be harmed.

4.4.2.4. Compensatory Mitigation

Because the Mohave ground squirrel and desert tortoise occupy similar habitat, compensatory mitigation proposed for MGS (3:1 ratio) will also cover the desert tortoise.

4.4.2.5. Cumulative effects

Because the project area is outside the natural range of the desert tortoise, none of the proposed alternatives will contribute to cumulative effects on the desert tortoise.

4.4.3. Discussion of the Northern Harrier SSC

4.4.3.1. Survey Results

Northern harriers nest on the ground in or at the edges of marshes or wet grasslands. They often hunt over adjacent uplands. No northern harriers were seen during the raptor surveys for this project, ,although northern harriers were seen occasionally in the study area during other fieldwork. They may nest nearby in wet grassland areas or on the edges of Owens Lake.

4.4.3.2. Avoidance and Minimization Efforts

Caltrans designed the alternatives to avoid effects to all wetland habitats. Hydrological changes will be minimized because culverts will be constructed where streams cross the highway. The following Contract Special Provisions will protect individual and nesting birds.

Use when any ground or vegetation disturbing work may occur during the nesting season between February 15 and September 1.

This specification requires a notice to the Resident Engineer Pending File. When notified by the Contractor that ground or vegetation disturbing work is anticipated between February 15 and September 1, the Engineer will request a pre-construction survey by the Department's Biologist within 2 working days of the Contractor’s notification so that the District Biologist may complete necessary surveys and report back to the Engineer within the 15 working day schedule. Presence of nesting birds may require work stoppage.

The District Biologist and Design Engineer should consult to identify and resolve potential scheduling conflicts between project needs and migratory bird, erosion control and endangered species issues.

This is a general Migratory Bird Treaty Act specification. Additional specifications for specific species such as swallows or for particular exclusion issues or devices may be necessary in addition to this general specification. Contact the District Biologist or DEA Wildlife Biologist for guidance.

Additional specifications may be necessary when the contractor is required to supply a qualified Consulting Biologist to conduct surveys, inspections or monitoring.

The Federal Migratory Bird Treaty Act (15 USC 703-711) 50 CFR Part 21 and 50 CFR Part 10, and the California Department of Fish and Game Code Sections 3503, 3513, and 3800, protect migratory birds, their occupied nests, and their eggs from disturbance or destruction. “Migratory Bird” includes all non-game, wild birds found in the United States, except the house sparrow, starling, and feral pigeon. A representative of the Department of the Interior U.S. Fish and Wildlife Service, or a California Department of Fish and Game warden may arrest persons responsible for violating these laws. These laws specify damage recovery, fines or penalties of up to $10,000 or six months imprisonment, or both. Migratory birds may try to nest on the ground, on structures or in trees, shrubs or other vegetation within the project limits. The Contractor may choose to use appropriate exclusion techniques to avoid nesting season delays. The Contractor shall notify the Engineer 15 working days prior to beginning any ground or vegetation disturbing work between February 15 and September 1. The Engineer will request a pre-construction survey by the Department's Biologist prior to the beginning of work between February 15 and September 1. If evidence of bird nesting is discovered, the Contractor shall not disturb the nesting birds or the nest until the birds have left the nest. If evidence of migratory bird nesting is discovered after beginning work, the Contractor shall immediately stop work and notify the Engineer.

Full compensation for preventing nesting and for conforming to the requirements in these special provisions shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefore. No extension of time or compensation will be granted for a suspension of work due to nesting migratory birds.

If, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's or Biologist's delay, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Nothing in this section shall relieve the Contractor from providing for public safety in conformance with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

4.4.3.3. Project Impacts

There will be no direct or indirect effects to potential nesting habitat for northern harriers under any alternative. Because harriers may forage over uplands adjacent to wetland habitat, some foraging habitat will be removed as a part of the project alternatives.

4.4.3.4. Compensatory Mitigation

No compensatory mitigation is being proposed.

4.4.3.5. Cumulative Effects

Within the study area, the only current or proposed project that may affect the northern harrier is the Southern Zones Dust Control Project (CH2MHill 2001). This project is revegetating wetland habitat and thus will have a beneficial effect.

4.4.4. Discussion of the Sharp-Shinned hawk SSC

4.4.4.1. Survey Results

No sharp-shinned hawks were seen during the raptor surveys for this project, and none was seen during other fieldwork. They are not expected to nest in the area. Small (1994) describes confirmed nestings as “relatively few” in California. However, they may be present during migration and in winter.

4.4.4.2. Avoidance and Minimization Efforts

Because there are no active nesting areas in the project area, no avoidance or minimization efforts are required.

4.4.4.3. Project Impacts

No direct or indirect effects will occur because sharp-shinned hawks do not nest in the area and are expected to be present only during migration and in winter.

4.4.4.4. Compensatory Mitigation

Because there will be no effects to sharp-shinned hawks, no compensatory mitigation is required.

4.4.4.5. Cumulative Effects

Because there will be no effect on sharp-shinned hawks, there will be no cumlative effect to them from this project.

4.4.5. Discussion of the Cooper’s hawk SSC

4.4.5.1. Survey Results

No Cooper’s hawks were seen during the raptor surveys for this project, but at least one was seen during other fieldwork. They are not expected to nest in the area. Small (1994) describes nesting requirements as “riparian woodlands in canyons or floodplains.” Because they are widespread in California during migration (Small 1994), they may be present during migration and in winter.

4.4.5.2. Avoidance and Minimization Efforts

Because there are no active nesting areas in the project area, no avoidance or minimization efforts are required.

4.4.5.3 Project Impacts

Because Cooper’s hawks do not nest in the area, and are expected to be present only during migration and in winter, no alternative proposed for this project will have an effect on them.

4.4.5.4. Compensatory Mitigation

Because there will be no effects to Cooper’s hawks, no compensatory mitigation is required.

4.4.5.5. Cumulative Effects

Because there will be no effects to Cooper’s hawks, there will be no cumlative effect to them from this project.

4.4.6. Discussion of the ferruginous hawk FSC, SSC

4.4.6.1. Survey Results

No ferruginous hawks were seen during the raptor surveys for this project, and none was seen during other fieldwork. They do not nest in California, and thus are not expected to nest in the area. However, they may be present during migration and in winter.

4.4.6.2. Avoidance and Minimization Efforts

There is no need for active avoidance or minimization efforts for ferruginous hawks.

4.4.6.3. Project Impacts

Because ferruginous hawks do not nest in the area, and are expected to be present only during migration and in winter, no alternative proposed for this project will have an effect on them..

4.4.6.4. Compensatory Mitigation

Because there will be no effects to ferruginous hawks, no compensatory mitigation is required.

4.4.6.5. Cumulative Effects

Because there will be no effects to ferruginous hawks, there will be no cumlative effects to them from this project.

4.4.7. Discussion of the Swainson’s hawk ST

4.4.7.1. Survey Results

Swainson’s hawks breed in the Central Valley and Owens Valley, often nesting in trees adjacent to agricultural fields or pastures. They forage over open shrublands, alfalfa fields, and pastures. They are present in California only for nesting, and they winter in South America. No Swainson's hawks were observed during the focused surveys or during any other fieldwork on this project. Stick nest sites were frequently observed, but no Swainson's hawks were seen on or near them.

In correspondence dated 17 May 2001 to R. Schlorff of CDFG, Karyn Sernka, who has conducted surveys for Swainson's hawks in the area for several years, reported seeing no Swainson's hawks in a historically occupied territory at the southeastern part of the study area off Cactus Flat Road in May of 2001. She related that the last time the territory was occupied was in 1999, when the nest failed. This may be the same nest reported in Bagley and Leatherman (1999). In a draft report, Sernka (no date) presented results of a Swainson's hawk survey in the Owens Valley in 1998 in which no Swainson's hawk nests were found south of Big Pine, some 40 miles north of the study area.

In an email to T. Kucera dated 29 July 2002, Ms. Sernka reported that in the spring of 2002 there was a nesting pair of Swainson's hawks "…off Cactus Flat Road in one of the windbreak trees on the west side of an alfalfa field**.** An active Swainson's hawk nest was not found in Olancha in 2001….I believe it was 2000 (and/or 1999?) when a pair of Swainson's hawks were nesting in Olancha off Cactus Flat road in a locust tree in the windbreak on the south side of the alfalfa field. We were unsuccessful trapping/banding the adults that year due to high winds. This year we were able to band one adult at the Olancha nest." This nest is approximately one km (0.6 mi) east of the southern end of the project area. Swainson's hawks, then, appear to nest sporadically in the vicinity of the project area.

4.4.7.2. Avoidance and Minimization Efforts

Alternatives were designed where possible to avoid removal of trees. Only Alternative 1 includes removing trees; 35 trees would be removed under this alternative.

Contract Special Provisions for Migratory Birds

The Federal Migratory Bird Treaty Act (15 USC 703-711) 50 CFR Part 21 and 50 CFR Part 10, and the California Department of Fish and Game Code Sections 3503, 3513, and 3800, protect migratory birds, their occupied nests, and their eggs from disturbance or destruction. "Migratory Bird" includes all non-game, wild birds found in the United States, except the house sparrow, starling and feral pigeon. A representative of the Department of the Interior U.S. Fish and Wildlife Service, or a California Department of Fish and Game warden may arrest persons responsible for violating these laws. These laws specify damage recovery, fines or penalties of up to $10,000 or six months imprisonment, or both. Migratory birds may try to nest on the ground, on structures or in trees, shrubs or other vegetation within the project limits. The Contractor may choose to use appropriate exclusion techniques to avoid nesting season delays. The Contractor shall notify the Engineer 15 working days prior to beginning any ground or vegetation disturbing work between February 15 and September 1. The Engineer will request a pre-construction survey by the Department's Biologist prior to the beginning of work between February 15 and September 1. If evidence of bird nesting is discovered, the Contractor shall not disturb the nesting birds or the nest until the birds have left the nest. If evidence of migratory bird nesting is discovered after beginning work, the Contractor shall immediately stop work and notify the Engineer.

Full compensation for preventing nesting and for conforming to the requirements in these special provisions shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefore. No extension of time or compensation will be granted for a suspension of work due to nesting migratory birds.

If, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's or Biologist's delay, the Contractor will be compensated for any resulting loss, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Nothing in this section shall relieve the Contractor from providing for public safety in conformance with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

4.4.7.3. Project Impacts

By implementing the Contract Special Provisions direct effects to individual or nesting birds will not occur. Alternative 1 may have indirect effects because potential nesting trees will be removed. Alternatives 2, 2a, 3, and 3a do not require removing any potential nesting trees and therfore will not have an indirect effect.

4.4.7.4. Compensatory Mitigation

Alternative 1 proposed to remove 35 trees. Caltrans is proposing to replace the trees at a 2:1 ratio to ensure inkind replacement and provide replacement habitat. Plantings will occur as close to the project area as possible. Alternative 2, 2a, 3, and 3a are not removing any trees so no compensatory mitigation is proposed for those alternatives.

4.4.7.5. Cumulative Effects

Cumulative effects are not expected to occur.

4.4.8. **Discussion of the golden eagle** SSC

4.4.8.1. Survey Results

No golden eagles were seen during the raptor surveys for this project, although they were seen flying high over the area during other fieldwork. They are not expected to nest in the area. The golden eagle nests in cliffs or trees in remote areas, and forages over open county. There is no appropriate nesting habitat for the golden eagle in the study area, but they can be expected to forage nearby both in summer and in winter and on migration.

4.4.8.2. Avoidance and Minimization Efforts

Because there are no active nesting areas in the project area, no avoidance or minimization efforts are required.

4.4.8.3. Project Impacts

Because golden eagles do not nest in the area, , none of the proposed alternatives of the project will have an effect on them.

4.4.8.4. Compensatory Mitigation

Because there will be no effects to golden eagles, no mitigation is required.

4.4.8.5. Cumulative Effects

Because there will be no effects to golden eagles, there will be no cumulative effect to them from this project.

4.4.9. **Discussion of the prairie falcon** SSC

4.4.9.1. Survey Results

No prairie falcons were seen during the raptor surveys for this project, and none was seed during other fieldwork. The prairie falcon nests in cliffs in remote areas, and forages over open county. There is no appropriate nesting habitat for the prairie falcon in the study area, but they can be expected to forage nearby both in summer and in winter and on migration.

4.4.9.2. Avoidance and Minimization Efforts

Because there are no active nesting areas in the project area, no avoidance or minimization efforts are required.

4.4.9.3. Project Impacts

Because prairie falcons do not nest in the area, none of the proposed alternatives of the project will have an effect on them.

4.4.9.4. Compensatory Mitigation

Because there will be no effects to prairie falcons, no mitigation is required.

4.4.9.5. Cumulative Effects

Because there will be no effects to prairie falcons, there will be no cumulative effect to them from this project.

4.4.10. Discussion of the burrowing owl FSC, SSC

4.4.10.1 Survey Results

No burrowing owls were seen during the raptor surveys for this project, and none was seen during other fieldwork. The burrowing owl is a small, diurnal owl that nests in the ground, often in the burrows of ground squirrels. Bagley and Leatherman (1999) also report finding no sign of burrowing owls. It is unlikely that they occur in the project area. Small (1994:135) describes them as "extremely rare east of the Sierra Nevada crest."

4.4.10.2. Avoidance and Minimization Efforts

Because the burrowing owl likely is not present, no avoidance and minimization efforts will be required.

4.4.10.3 Project Impacts

Because the burrowing owl likely is not present, no effects to it are to be expected from any of the alternatives.

4.4.10.4. Compensatory Mitigation

Because the burrowing owl likely is not present, no compensatory mitigation is required.

4.4.10.5. Cumulative Effects

Because the burrowing owl is likely not present and is extremely rare east of the Sierra Nevada, there will be no cumulative effects to it from the present project.

4.4.11. Discussion of the long-eared owl SSC

4.4.11.1. Survey Results

No long-eared owls were seen during the raptor surveys for this project, and none was seen during other fieldwork. Long-eared owls require dense stands of trees for roosting and nesting, and they forage over adjacent open areas. There are no dense stands of trees in the study area, so it is unlikely that long-eared owls are present. Bagley and Leatherman (1999) contains a report of a nesting pair of long-eared owls immediately north of North Haaiwee Dam, approximately one km (0.6 mi) east of the southern boundary of the study area..

4.4.11.2. Avoidance and Minimization Efforts

Because the long-eared owl likely is not present in the project area, no avoidance and minimization efforts will be required.

4.4.11.3. Project Impacts

The long-eared owl is likely not present in the study area. The nearest known nesting site is about one km (0.6 mi) from the southern end of the project area, and there will be no effect to it from any of the alternatives of the present project.

4.4.11.4. Compensatory Mitigation

Because the long-eared owl likely is not present in the study area and the nearest know nesting site will not be affected, no compensatory mitigation is required.

4.4.11.5. Cumulative Effects

Because the long-eared owl is likely not present in the study area, and the nearest nesting site will not be affected, there will be no cumulative effects to it from the present project.

4.4.12. Discussion of the loggerhead shrike FSC, SSC

4.4.12.1. Survey Results

The loggerhead shrike nests in dense shrubs, and hunts in areas with sparse vegetation, often from perches. During fieldwork on Mohave ground squirrel and desert tortoise surveys in the study area, loggerhead shrikes were seen on several occasions. Loggerhead shrikes in the Owens Valley migrate to the southern deserts for the winter (Small 1994).

4.4.12.2. Avoidance and Minimization Efforts

None are proposed.

4.4.12.3. Project Impacts

By removing some desert scrub habitats, the project may result in the loss of some nesting and foraging habitat.

4.4.12.4. Compensatory Mitigation

There is no compensatory mitigation proposed.

4.4.12.5. Cumulative Effects

No other surface-disturbing actions are known to be occurring or proposed in the study area.

4.4.13. Discussion of LeConte's thrasher

4.413.1. Survey Results

LeConte's thasher is an uncomon to fairly common resident of the most hot and dry portions of California (Small 1994). In the Mohave desert, it lives in desert scrub with creosote bush, nesting in cholla cactus. None was seen during any fieldwork on this project.

4.4.13.2. Avoidance and Minimization Efforts

Because LeConte's thasher likely is not present in the project area, no avoidance and minimization efforts will be required.

4.4.13.3. Project Impacts

Because LeConte's thasher likely is not present in the project area , no effects to it from any alternative are expected.

4.4.13.4. Compensatory Mitigation

Because LeConte's thrasher likely is not present in the project area, no compensatory mitigation is required.

4.4.13.5. Cumulative Effects

Because there will be no effects on LeConte's thrasher from this project, there will be no cumulative effect to them from this project.

4.4.14. Discussion of bats

4.4.14.1. Survey Results

Bats typically roost during the day, in a variety of situations, including in buildings, under bridges, in hollows or under loose bark of trees, in mines, caves, and cracks and crevices on rock faces. They forage at night. Bat species identified during the bat surveys in the project area included the pallid bat, spotted bat, small-footed myotis, long-legged bat, yuma myotis, long-eared myotis, and fringed myotis. The aggregation of bats under the bridge over the Los Angeles aaqueduct was probably the site of a maternity colony of Yuma myotis, based on the number of bats flying in and out from under the bridge and the May date of the survey (Figure 5).

4.4.14.2. Avoidance and Minimization Efforts

Before construction disturbance begins, an exclusion structure will be built to prevent bats from using the bridge. Timing of the installation of the structure so as not to trap bats in side will be determined following two years of monitoring to determine when bats are not present.

4.4.14.3. Project Impacts

There will be a temporary loss of roosting habitat during construction.

4.4.14.4. Compensatory Mitigation

The replacement bridge will be constructed to be more bat friendly than the existing structure, including being higher over the aqueduct to ease access by bats to it and reduce the probability of bats drowning due to fluctuating water levels in the aqueduct.

4.4.14.5. Cumulative Effects

At present, the low height of the existing bridge may be affecting access by bats due to fuctuating water levels in the aqueduct below it. The new structure as proposed will reduce or eliminate this.

4.4.15. Discussion of the Mohave ground squirrel ST

4.4.15.1. Survey Results

In 2001, we captured no Mohave ground squirrels (Tables 8, 9). During the first trapping session in 2002, we captured Mohave ground squirrels on grids 1, 2, 13 and 14 (Table 10, Figure 3). During the second trapping session in 2002, we trapped at all 10 of the original grids and again captured Mohave ground squirrels on grids 1 and 2 (Table 11). No Mohave ground squirrels were captured on any of the other 8 original grids. We thus conclude that Mohave ground squirrels are present on the southern portion of the study area.

Table 8. Results of live-trap ground squirrel survey in the Olancha project area,Inyo County, during Session 1, April 2-12, 2001.

Grid Number	White-tailed Antelope Squirrel		Mohave Ground Squirrel	
	Individuals	Captures	Individuals	Captures
1	7	8	0	0
2	6	9	0	0
3	8	12	0	0
4	4	6	0	0
5	0	0	0	0
6	0	0	0	0
7	1	1	0	0
8	0	0	0	0
9	1	1	0	0
10	0	0	0	0
Totals	27	37	0	0

Table 9. Results of live-trap ground squirrel survey in the Olancha project area, Inyo County, during Session 2, May 6-16, 2001.

Grid Number	White-tailed Antelope Squirrel		Mohave Ground Squirrel	
	Individuals	Captures	Individuals	Captures
1	1	1	0	0
2	4	4	0	0
3	8	9	0	0
4	1	1	0	0
5	1	1	0	0
6	2	2	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
Totals	17	18	0	0

Table 10. Results of live-trap ground squirrel survey in the Olancha project area, Inyo County, during Session 1, 26 March-5 April 2002.

Grid Number	White-tailed Antelope Squirrel		Mohave Ground Squirrel	
	Individuals	Captures	Individuals	Captures
1	20	63	6 (4m, 2f)	17
2	26	109	4 (1m, 3f)	11
13	10	19	4 (2m, 2f)	7
14	7	22	3 (1m, 2f)	7
15	17	50	0	0
3	19	74	0	0
4	11	31	0	0
6	8	30	0	0
7	20	70	0	0
10	1	1	0	0
Totals	139	469	17 (8m, 9f)	42

Table 11. Results of live-trap ground squirrel survey in the Olancha project area, Inyo County, during Session 2, 6-16 May 2002.

Grid Number	White-tailed Antelope Squirrel		Mohave Ground Squirrel	
	Individuals	Captures	Individuals	Captures
1	29	83	3 (3 m, 0f)	15
2	33	137	3 (0m, 3f)	10
3	22	88	0	0
4	41	81	0	0
6	15	53	0	0
5	13	39	0	0
7	20	41	0	0
8	9	36	0	0
9	9	34	0	0
10	0	0	0	0
Totals	191	592	6 (3m, 3f)	25

4.4.15.2. Avoidance and Minimization Efforts

None are planned.

4.4.15.3. Project Impacts

Based on our trapping results, we assume that the southern end of Grid 3 is the northern boundary of the distribution of Mohave ground squirrels on the project area Thus, the proposed alignments (from right-of-way fence to right-of-way fence) will remove the following amounts of Mohave ground squirrel habitat:

Alernative 1. 20.6 ha (50.8 ac)

Alternatives 2 and 2a. 34.1 ha (84.3 ac)

Alternatives 3 and 3a. 24.8 ha (61.2 ac).

4.4.15.4. Compensatory Mitigation

Based on informal consultation with CDFG, Bishop Office,compensatory mitigation for the loss of Mohave ground squirrel habitat will be at a ratio of 3:1.

4.4.15.5. Cumulative Effects

There are no other known projects in the study area that are likely to affect the Mohave ground squirrel.

4.4.16. Discussion of the Owens Valley vole FSC, SSC

4.4.16.1. Survey Results

The Owens Valley vole is a subspecies of the common and widely distributed California vole. It inhabits wet meadows in the Owens Valley. The one individual *Microtis californicus* was captured in irrigated pasture on trapline 4, in Olancha (Figure 6). This is likely the *vallicola* subspecies, or the Owens Valley vole, a California Species of Special Concern.

Other species of small mammal captured in the project area included the little pocket mouse (*Perognathus longimembris*), long-tailed pocket mouse (*Chaetodipus formosus*), Merriam's kangaroo rat (*Dipodomys merriami*), chisel-toothed kangaroo rat (*D. microps*), souhern grasshopper mouse (*Onychomys torridus*), pinyon mouse (*Peromyscus truei*), deer mouse (*P. maniculatus*), desert woodrat (*Neotoma lepida*), dusky-footed woodrat *(Neotoma fuscipes*), western harvest mouse (*Reithrodontomys megalotis*), and white-tailed antelope squirrel (*Ammospermophilus leucurus*) (Table 12**).**

Table 12. Small mammal captures by species and trapping location during October 8-11, 2001, near Olancha, Inyo County, California.

Species	Trapline						
	1	2	3	4	7	8	9
Pelo	4 (1)					1 (1)	2 (1)
Chfo						10 (13)	
Dime		4 (3)	3 (5)			1 (1)	1
Dimi	6 (5)	2 (1)	2 (1)				6 (6)
Onto	1						
Petr				2			
Pema				10	20 (10)		
Nele				3			
Nefu				7 (2)			
Reme				1	1		
Mica				1			
Amle	4 (2)	10 (5)	8 (7)				

Numbers in parentheses indicate the number of recaptures. Abbreviations are Pelo (*Perognathus longimembris*), Chfo (*Chaetodipus formosus*), Dime (*Dipodomus merriami*), Dimi (*Dipodomys microps*), Onto (*Onychomys torridus*), Petr (*Peromyscus truei*), Pems (*Peromyscus maniculatus*), Nele (*Neotoma lepida*), Nefu (*Neotoma fuscipes*), Reme (*Reithrodontomys megalotis*), Mica (*Microtus californicus*), Amle (*Ammospermophilus leucurus*).

4.4.16.2. Avoidance and Minimization Efforts

Caltrans designed all the the alternatives to avoid effects to all wetland habitats. Hydrological changes will be minimized because culverts will be installed where streams cross the highway.

4.4.16.3. Project Impacts

Caltrans designed all the alternatives to avoid effects to all wetland habitats. Indirect effects due to hydrological changes will be minimized because culverts will be constructed where streams cross the highway.

4.4.16.4. Compensatory Mitigation

Compensatory mitigation is not required because all wetlands in the study area are being avoided.

4.4.16.5. Cumulative Effects

Within the study area, the only current or proposed project that may affect the Owens Valley vole is the Southern Zones Dust Control Project (CH2MHill 2001). With revegetation of wetland areas, habitat for voles may be improved.

5. Determination of Effects

Table 13. Determination of effects.*

Species or habitat	Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Alternative 3a
Federally-listed or proposed species and critical habitat					
Desert tortoise	No effect	No effect	No effect	No effect	No effect
Owen's tui chub	No effect	No effect	No effect	No effect	No effect
Least Bell's vireo	No effect	No effect	No effect	No effect	No effect
Owen's pupfish	No effect	No effect	No effect	No effect	No effect
Habitat identified for recovery in the Owens Basin recovery plan					
Southern Owens Conservation Area	Not likely to adversely affect	Not likely to adversely affect	Not likely to adversely affect	Not likely to adversely affect	Not likely to adversely affect
Other special-status species					
Inyo County star-tulip	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing
pygmy poppy	No effect	No effect	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing
sanicle cymopterus	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	No effect	No effect
Inyo phacelia	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing
Swainson's hawk	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing
Mohave ground squirrel	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing
Parish's popcorn-flower	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing
Owens Valley checkerbloom	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing

Species or habitat	Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Alternative 3a
alkali cord grass	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing

* A “no effect” determination has been made for all other species listed in Tables 6 and 7.

The determination of “Not likely to adversely affect” for the Southern Owens Conservation Area is based on the absence of direct effects and the low likelihood of indirect effects. The exact boundaries of the Southern Owens Conservation Area have not been determined, but the tentative boundary (USFWS 1996b) incorporates a small amount of the wetlands in the study area near the Highway 395/Highway 190 intersection. Caltrans designed the alternatives for this project to avoid direct effects to all wetland habitats. Indirect effects due to hydrological changes will be minimized because culverts will be constructed where streams cross the highway. Other indirect effects are possible due to road runoff, but this is a remote possibility and the amount of runoff reaching the wetlands will not likely be any greater than that currently experienced. Thus, this project may affect the Southern Owens Conservation Area, but only the very southern tip of the area would affected, the effects would be indirect, and actual effects are unlikely, hence the determination.

Inyo County star-tulip, Inyo phacelia, Parish’s popcorn-flower, Owens Valley checkerbloom, and alkali cord grass grow in wetland habitats, and thus the rationale for the determinations of “Not likely to trend towards Federal listing” are similar to the rationale for the Southern Owens Conservation Area. None of these species were found in the study area, but three of them are known to occur in the wetlands east of the study area and the others have a high probability of co-occurring in those wetlands. All known occurrences are 140 m (459 ft) or more from any of the alternatives. Direct effects to the wetlands are being avoided, and indirect hydrological effects are being minimized. The threat posed by indirect road runoff would not be any greater than in the current situation. Thus, the proposed project may affect these species, but it is not likely to contribute to the necessity of Federal listing.

Pygmy poppy is in the path of Alternatives 2a and 3a; approximately 22 percent of the observed occupied habitat would be affected directly if either of those alternatives were chosen. Alternative 3 is 35 m (115 ft) from the observed population, but the pygmy poppy population could be more extensive in a wetter year, and thus has some potential to be affected directly by this alternative. Prior to the discovery of the population in the study area, pygmy poppy was not even being considered for candidate status; the loss of 22 percent of the study area population would not make it rarer than it had been previously. Thus, a determination of "Not likely to trend towards Federal listing" has been made for Alternatives 2a, 3, and 3a. No direct or indirect effects to pygmy poppy are anticipated from Alternatives 1 or 2 because the occupied habitat is at least 139 m (456 ft) upslope from the proposed alignments, hence the determination of "No effect" for those alternatives.

Sanicle cymopterus grows in upland habitats in close proximity to Alternatives 1, 2, and 2a; it may have been found in the study area in a wetter year. If populations were found in the study area and then affected by the project, the status of sanicle cymopterus would be similar to the status as of 2002, when this taxon was not even being considered for candidate status. Thus, any potential effects of this project on sanicle cymopterus would not be likely to result in a trend toward Federal listing. Alternatives 3 and 3a are much farther from the known sanicle cymopterus populations and suitable habitat than the existing highway, hence the determination of "No effect" for those alternatives.

Desert tortoise was not found in the study area, which is probably north of its native range in California. Owen's tui chub and Owens pupfish are also outside the study area; because no alternatives of the project will affect local hydrology, no effects are expected to the hearby population of Owen's tui chub. Habitat for least Bell's vireo does not occur, and no least Bell's vireos were seen on the study area, and thus the project will not affect it.

Swainson's hawk is known to nest occasionally in trees approximately one km (0.6 mi) east of the study area, and under Alternative 1, some trees along the existing right-of-way that potentially could be used by Swainson's hawks would be removed. If this is the alternative selected, Caltrans will replace the trees at a 2:1 ratio, and plantings will occur as close to the project area as possible. No trees would be removed under the other alternatives. Thus, the determination of "Not likely to trend towards Federal listing" was made for Swainson's hawk.

Mohave ground squirrels were found on the study area, at the two most southerly trapping locations. Under the various alternatives, between 20.6 ha (50.8 ac) and 34.1 ha (84.3 ac) of Mohave ground squirrel habitat wouuld be lost. Compensatory mitigation for the loss of this habitat will be at a ratio of 3:1. Thus, a determination of "Not likely to trend towards Federal listing" was made for the Mohave ground squirrel.

6. Results: Permits and Technical Studies for Special Laws or Conditions

6.1. Regulatory Requirements

This document is prepared in accordance with State and Federal laws, regulations and Executive Orders. Following is a brief summary of the principal environmental statutes that apply to the project analyzed in this document.

6.1.1. Federal Laws and Regulations

National Environmental Policy Act (42 U.S.C. 4321 et seq.). NEPA declares a continuing Federal policy "to use all practicable means and measures...to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations." NEPA directs "a systematic, interdisciplinary approach" to planning and decision making and requires environmental statements for "major Federal actions significantly affecting the quality of the human environment." Implementing regulations by the Council on Environmental Quality (CEQ) (40 CFR Parts 1500-1508) requires Federal agencies to identify and assess reasonable alternatives to proposed actions that will restore and enhance the quality of the human environment and avoid or minimize adverse environmental impacts. Federal agencies are further directed to emphasize significant environmental issues in project planning and to integrate impact studies required by other environmental laws and Executive Orders into the NEPA process. The NEPA process should therefore be seen as an overall framework for the environmental evaluation of Federal actions.

Endangered Species Act of 1973 (16 U.S.C. 1531-1543). This act and subsequent amendments provide guidance for the conservation of endangered and threatened species and the ecosystems upon which they depend. **Section 7** requires Federal agencies, in consultation with, and with the assistance of the Secretary of the Interior or the Secretary of Commerce, as appropriate, to insure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species. The U. S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) share responsibilities for administering the Act. Regulations governing interagency cooperation under Section 7 are found at 50 CFR Part 402. The opinion issued at the conclusion of consultation will include a statement authorizing take that may occur incidental to an otherwise legal activity.

Migratory Bird Treaty Act (16 U.S.C. 703-711). This treaty with Canada, Mexico and Japan makes it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill migratory birds. The law applies to the removal of nests (such as swallow nests on bridges) occupied by migratory birds during the breeding season.

Clean Water Act (33 U.S.C. 1251-1376). The Clean Water Act (CWA) provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters.

Fish and Wildlife Coordination Act (16 U.S.C. 661-666). This act applies to any Federal project where the waters of any stream or other body of water are impounded, diverted, deepened, or otherwise modified. Project proponents are required to consult with USFWS and the appropriate state wildlife agency. These agencies prepare reports and recommendations that document project effects on wildlife and identify measures that may be adopted to prevent loss or damage to wildlife resources. The term "wildlife" includes both animals and plants. Provisions of the Act are implemented through the NEPA process and Section 404 permit process.

Executive Order 13112 Invasive Species (February 3, 1999). This order directs all federal agencies to prevent and control the spread of invasive plants and animals and to avoid direct or indirect effects whenever there is a practicable alternative

6.1.2. State Laws and Regulations

California Environmental Quality Act (P.R.C. 21000 et seq.). Pursuant to Guidelines for Implementation of the California Environmental Quality Act (CEQA) (originally printed 2-10-73) (Resources Agency 1983), Chapter 3 Section 15065, "A lead agency shall find that a project may have a significant effect on the environment and thereby require an EIR to be prepared for the project where any of the following conditions occur:

The project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, 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."

The guidelines further define Rare or Endangered Species under Section 15380 (Resources Agency 1983. Based on the definitions in section 15380, the species evaluated in this report are considered rare or endangered species under the auspices of the California Environmental Quality Act.

California Endangered Species Act (Fish and Game Code 2050 et seq.). This act establishes the policy of the State to conserve, protect, restore, and enhance threatened or endangered species and their habitats. The California Endangered Species Act (CESA) mandates that State agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. CESA requires State lead agencies to consult with the California Department of Fish and Game (CDFG) during the CEQA process to avoid jeopardy to threatened or endangered species. As an outcome of consultation, CDFG is required to issue a written finding indicating if a project would jeopardize threatened or endangered species and specifying reasonable and prudent alternatives that would avoid jeopardy. The Act provides for joint consultations when species are listed by both the State and Federal governments.

Native Plant Protection Act (Fish and Game Code 1900-1913). California's Native Plant Protection Act (NPPA) requires all State agencies to utilize their authority to carry out programs to conserve endangered and rare native plants. Provisions of NPPA prohibit the taking of listed plants from the wild and require notification of the DFG at least 10 days in advance of any change in land use. This allows DFG to salvage listed plant species that would otherwise be destroyed. Caltrans is required to conduct botanical inventories and consult with DFG during project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.

Sections 1601-1603 of the Fish and Game Code. Under these sections of the Fish and Game Code, Caltrans and other agencies are required to notify CDFG prior to any project that would divert, obstruct or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, DFG is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications and bid documents for the project.

6.2. Federal Endangered Species Act Consultation Summary

In a response to a letter from Wendy Philpott, District 9 biologist with Caltrans, requesting information on threatened and endangered species that maybe present near the proposed Olancha/Cartago 4-lane project, Diane K. Noda, Field Supervisor with the USFWS in Ventura, California, included three species. She wrote "The federally endangered least Bell's vireo (*Vireo bellii pusillus*), Owen's tui chub (*Gila bicolor snyderi*), and the Owen's pupfish (*Cyprinodon radiosus*) are the only federally listed species known to occur in the area." (Appendix F)

6.3. California Endangered Species Act Consultation Summary

Informal consultation was held with CDFG personnel Darryl Wong, Denyce Racine, and Adrienne Disbrow of Bishop and John Gustafson and Ronald Schlorff of Sacramento (Appendix F).

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Personal Communications

Mark Bagley. February 11, 2003. Re: his reported occurrences of Cymopterus ripleyi var. saniculoides in the Grant area. Consulting biologist, Bishop, California, phone 760-873-5326. Mark mailed me a copy of his CNDDB report form for Cymopterus ripleyi var. saniculoides population C2A. 2 pp.

M. Bradbury. 29 February 2000. Swainson's hawk surveys. mbradbur@cd-eso.water.ca.gov. Email to D. Newman of ESRP outlining survey procedures for Swainson's hawks.

Anne Halford. January 24, 2002. Re: rare plants potentially occurring in the Olancha area. Botanist, U.S. Bureau of Land Management, Bishop, California, phone 760-872-0522. Anne provided the locations where Mary DeDecker had found Canbya candida and Muilla coronata in the Olancha and Independence areas.

Paula Hubbard. January 24, 2002. Re: rare plants potentially occurring in the Olancha area. Botanist, Los Angeles Department of Water and Power, Bishop, California, phone 760-873-0327. Paula described the location of a known population of Calochortus excavatus near Black Rock and mentioned an unsubstantiated occurrence between Olancha and Cartago, between the bottling plant and the Owens Lake Bed.

Dr. Ron Kelley. February 19, 2003. Re: identity of the Plagiobothrys species found adjacent to the study area. Eastern Oregon University, La Grande, Oregon, phone 541-962-3327. Ellen Cypher mailed Dr. Kelley a specimen. He could not identify the plant with certainty without seeing both it and the Rabbit Springs population in person. He agreed that it is either Plagiobothrys parishii or an undescribed taxon. Dr. Kelley was recommended by taxonomists at the Jepson Herbarium as the national authority on the genus Plagiobothrys.

Tim Messick. February 5, 2002. Re: identity of the Plagiobothrys species found adjacent to the study area. Jones and Stokes, Sacramento, California. timm@jsanet.com. Tim had examined a specimen of the Plagiobothrys species and determined that it was P. parishii.

Diane K. Noda. 18 June 2002. Species list for a proposed project on Highway 395 between Post Mile 30 and 42, Inyo County, California. USFWS. 2pp.

Dr. Dean Taylor. January 30, 2003. Re: identity of the Plagiobothrys species found adjacent to the study area. Jepson Herbarium, Berkeley, California. dwtaylor@cruzers.com. Dr. Taylor had collected Plagiobothrys parishii in Inyo County in 1978. He said that the growth habit of the plants he found was similar to those found adjacent to the study area.

Tim Thomas. September 30, 2002. Re: identity of the Plagiobothrys species found adjacent to the study area. U.S. Fish and Wildlife Service, Barstow, California, phone 760-255-8890. Tim is familiar with the population of Plagiobothrys parishii in San Bernardino County. He had examined specimens and photographs of the Plagiobothrys species from the study area and indicated that he believed it to be an undescribed species, not P. parishii.

Wendy Philpott. February 5, 2003. Re: wetland delineation for the study area and appropriate nomenclature for plant communities. California Department of Transportation, Bishop, California, phone 760-872-2331. Wendy said that only the Willow Dip area and the wet meadows east of Highway 395 delineated as wetlands. The irrigated pastures qualify as Ag Wetlands.

K. Sernka. 17 May 2001. Owen's Valley Swainson's hawks. Western Ecological Services. kserenka@west-inc.com. Email to R. Schlorff of CDFG discussing results of surveys for Swainson's hawks in the Olancha/Cartago area, and history of nesting attempts in the vicinity.

K. Sernka. 29 July 2002. Owen's Valley Swainson's hawks. Western Ecological Services. kserenka@west-inc.com. Email to T. Kucera discussing Swainson's hawk surveys in 2001 and earlier years.

G. Walker 20 March 2001. Desert tortoise protocol. USFWS. George_Walker@fws.gov. Gave authorization to conduct desert tortoise surveys.

Appendix A. Project Alternatives

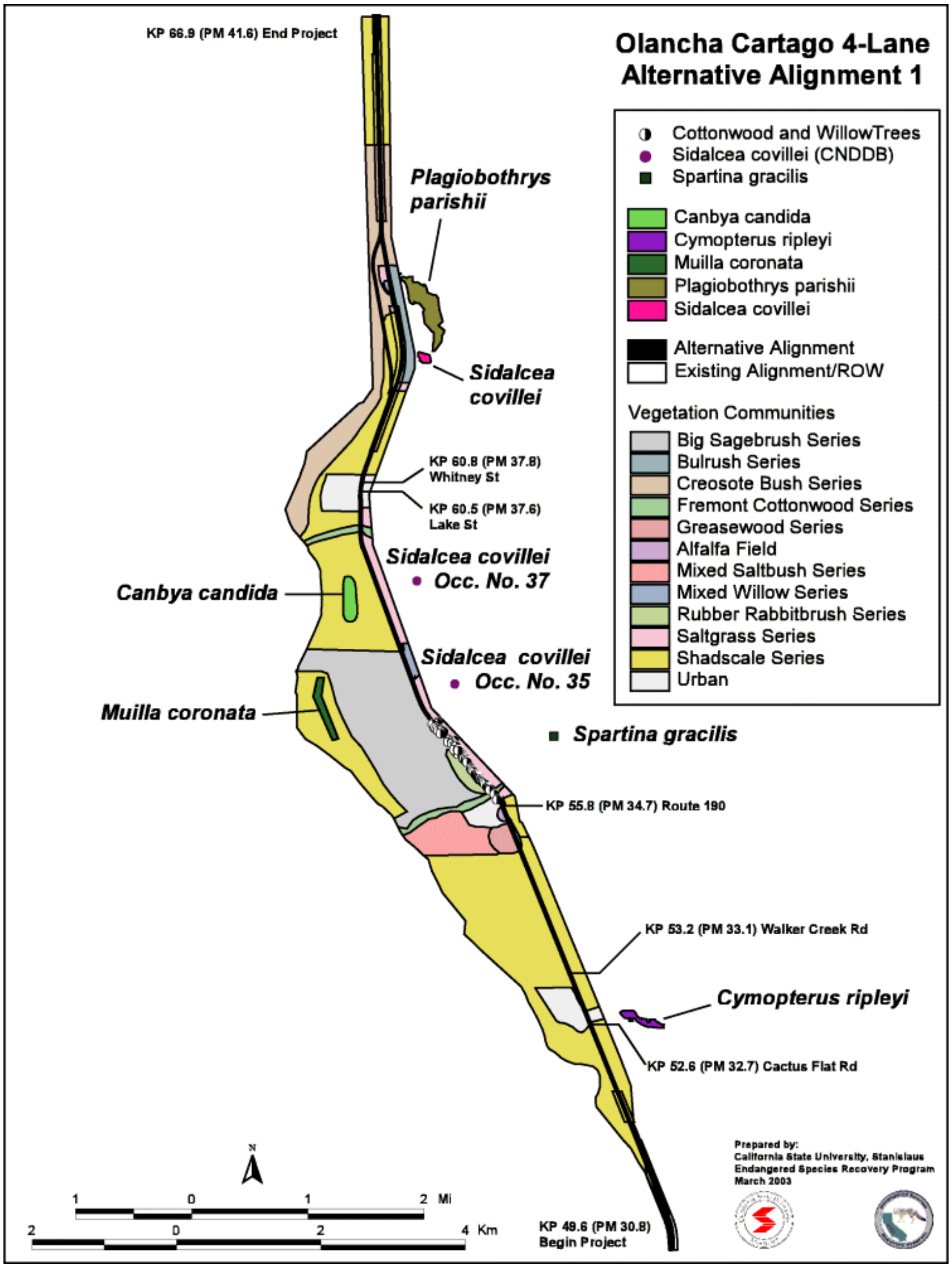

Figure A-1. Alternative alignment 1.

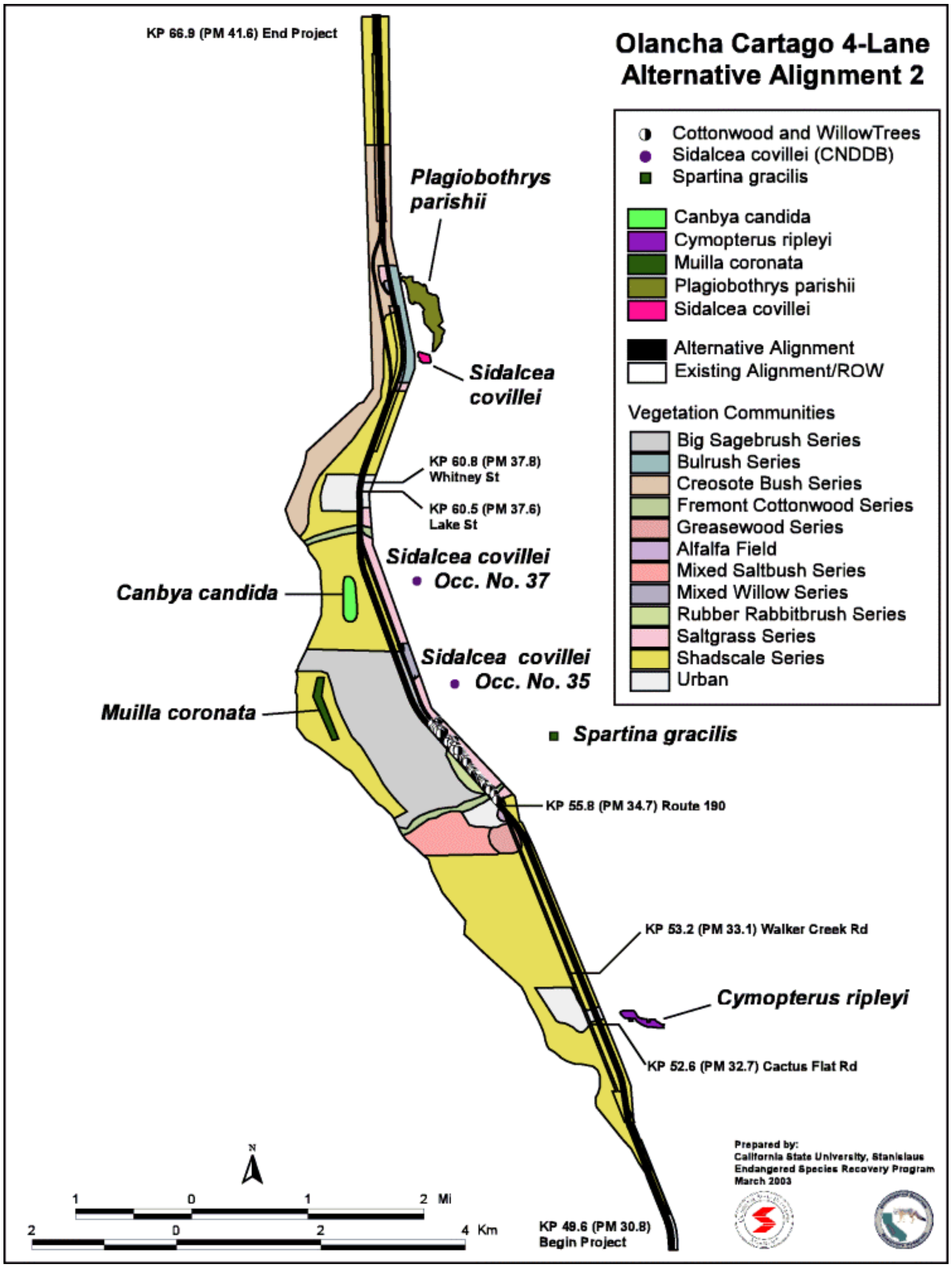

Figure A-2. Alternative alignment 2.

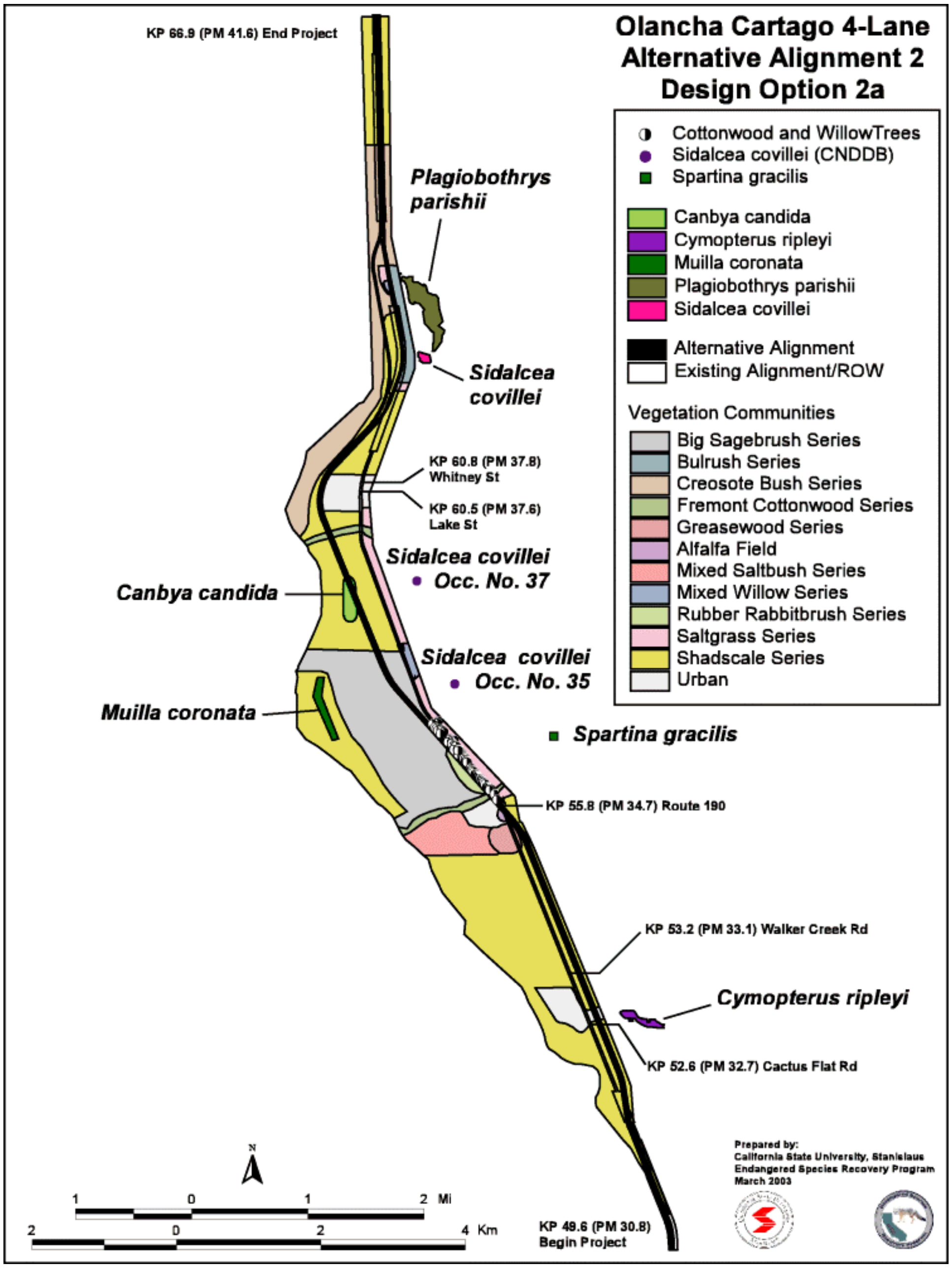

Figure A-3. Alternative alignment 2, design option 2a.

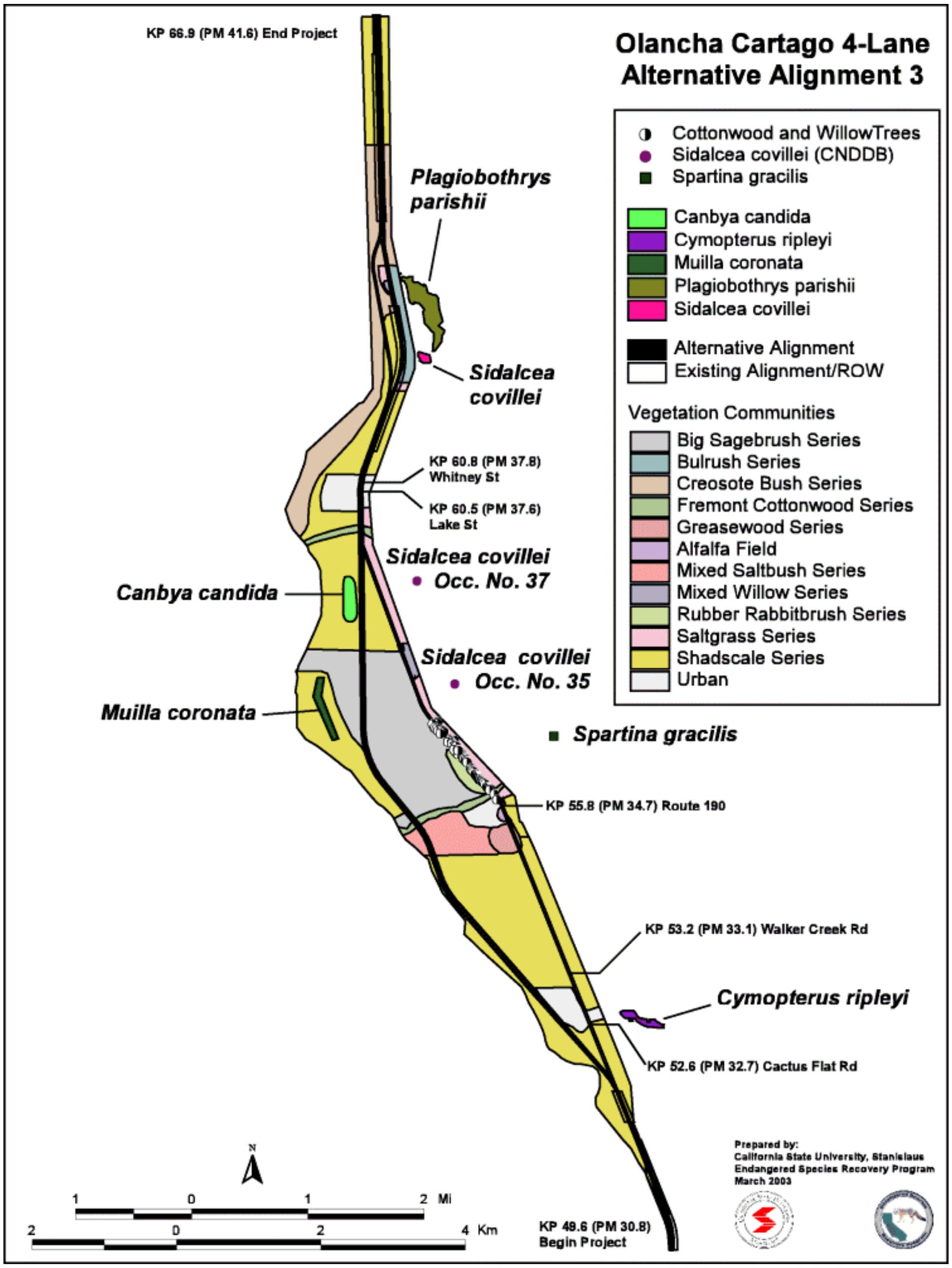

Figure A-4. Alternative alignment 3.

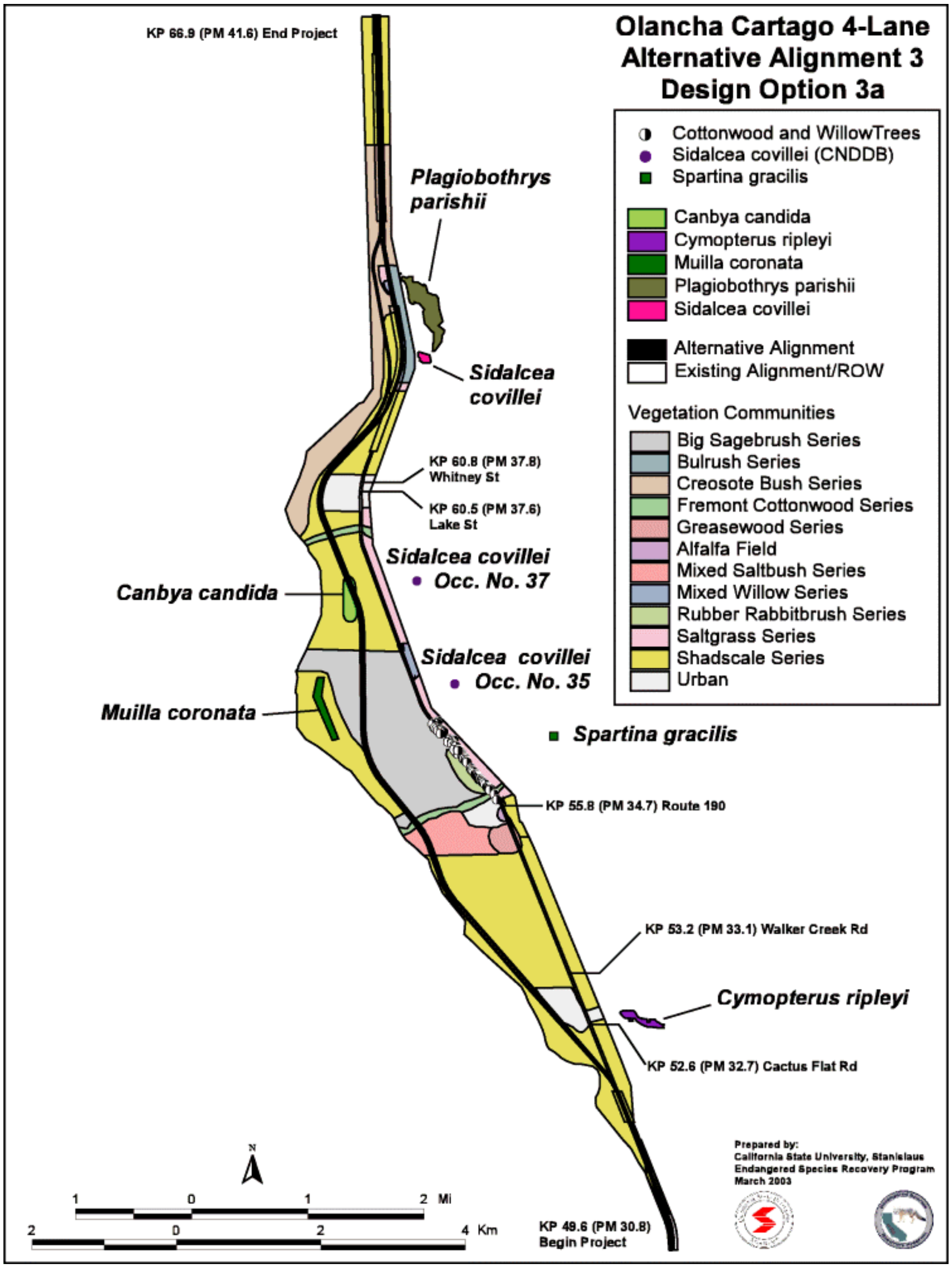

Figure A-5. Alternative alignment 3, design option 3a.

Appendix B. Natural communities occurring in the Olancha/Cartago four-lane study area, as defined under three vegetation classification systems.

Sawyer and Keeler-Wolf (1995)	California Natural Diversity Data Base (2002b)		Holland (1986)	
Series (Alliance) Name	**Code Number**	**Alliance or Association Name**	**Code Number**	**Community Name**
Big Sagebrush Series	35.110.00	Big Sagebrush Scrub	35210	Big Sagebrush Scrub
Creosote Bush Series	33.140.06	Mohave Creosote Bush Scrub Association	34100	Mohave Creosote Bush Scrub
Mixed Saltbush Series	36.301.00	Desert Saltbush Scrub	36110	Desert Saltbush Scrub
Rubber Rabbitbrush Series	35.310.00	Rubber Rabbitbrush Scrub	35400	Rabbitbrush Scrub
Shadscale Series	36.320.00	Shadscale Scrub	36140	Shadscale Scrub
Bulrush Series	52.204.00	Transmontane Alkali Marsh	52320	Transmontane Alkali Marsh
Fremont Cottonwood Series	61.130.04*	Mohave Riparian Association	61700	Mohave Riparian Forest
Greasewood Series	36.400.00*	Greasewood Scrub	36130	Desert Greasewood Scrub
Mixed Willow Series	61.207.00*	Mixed Willow Riparian Forests and Woodlands	61700	Mohave Riparian Forest
Saltgrass Series	45.500.00	Alkali Meadow	45310	Alkali Meadow

* "Indicates a series or association considered rare and worthy of consideration by CNDDB" (2002b).

Appendix C. Plants observed in the Olancha/Cartago four-lane study area during Spring 2001 and Spring 2002.

SCIENTIFIC NAME	FAMILY	ORIGIN	RARITY[1]	NOXIOUS CATEGORY[2]
Abronia pogonantha	Nyctaginaceae	Native		
Acamptopappus sphaerocephalus var. hirtellus	Asteraceae	Native		
Achnatherum (Oryzopsis) hymenoides	Poaceae	Native		
Achnatherum (Stipa) speciosum	Poaceae	Native		
Allium fimbriatum var. mohavense	Liliaceae	Native		
Amaranthus blitoides	Amaranthaceae	Native		
Ambrosia dumosa	Asteraceae	Native		
Ambrosia sp.	Asteraceae	-		
Amsinckia tessellata var. gloriosa	Boraginaceae	Native		
Anemopsis californica	Saururaceae	Native		
Angelica lineariloba	Apiaceae	Native		
Anisocoma acaulis	Asteraceae	Native		
Arabis glaucovalvula	Brassicaceae	Native		
Arabis pulchra var. pulchra	Brassicaceae	Native		
Argemone munita var. argentea	Papaveraceae	Native		
Artemisia ludoviciana ssp. incompta	Asteraceae	Native		
Artemisia spinescens	Asteraceae	Native		
Artemisia tridentata	Asteraceae	Native		
Arundo donax	Poaceae	Exotic		List A-1
Asclepias fascicularis	Asclepiadaceae	Native		
Asclepias speciosa	Asclepiadaceae	Native		
Astragalus lentiginosus var. fremontii	Fabaceae	Native		
Atriplex argentea var. argentea	Chenopodiaceae	Native		
Atriplex canescens ssp. canescens	Chenopodiaceae	Native		
Atriplex confertifolia	Chenopodiaceae	Native		
Atriplex phyllostegia	Chenopodiaceae	Native		
Atriplex polycarpa	Chenopodiaceae	Native		
Atriplex spinifera	Chenopodiaceae	Native		
Avena fatua	Poaceae	Exotic		Possible threat
Bassia hyssopifolia	Chenopodiaceae	Exotic		List B
Berula erecta	Apiaceae	Native		
Betula occidentalis	Betulaceae	Native		
Bromus catharticus	Poaceae	Exotic		
Bromus madritensis ssp. rubens	Poaceae	Exotic		List A-2
Bromus tectorum	Poaceae	Exotic		List A-1
Calyptridium monandrum	Portulacaceae	Native		
Camissonia boothii ssp. desertorum	Onagraceae	Native		
Camissonia claviformis ssp. aurantiaca x claviformis	Onagraceae	Native		
Camissonia claviformis ssp. claviformis	Onagraceae	Native		

SCIENTIFIC NAME	FAMILY	ORIGIN	RARITY[1]	NOXIOUS CATEGORY[2]
Camissonia parvula	Onagraceae	Native		
Camissonia sp.	Onagraceae	Native		
Canbya candida	Papaveraceae	Native	List 4	
Capsella bursa-pastoris	Brassicaceae	Exotic		
Carex nebrascensis	Cyperaceae	Native		
Carex sp.	Cyperaceae	-		
Castilleja angustifolia	Scrophulariaceae	Native		
Castilleja exserta	Scrophulariaceae	Native		
Castilleja miniata ssp. miniata	Scrophulariaceae	Native		
Caulanthus cooperi	Brassicaceae	Native		
Centaurium venustum	Gentianaceae	Native		
Centrostegia thurberi	Polygonaceae	Native		
Chaenactis stevioides	Asteraceae	Native		
Chaenactis xantiana	Asteraceae	Native		
Chamaesyce albomarginata	Euphorbiaceae	Native		
Chenopodium album	Chenopodiaceae	Exotic		
Chenopodium berlandieri	Chenopodiaceae	Native		
Chenopodium californicum	Chenopodiaceae	Native		
Chorizanthe brevicornu ssp. spathulata	Polygonaceae	Native		
Chrysothamnus nauseosus	Asteraceae	Native		
Chrysothamnus teretifolius	Asteraceae	Native		
Chrysothamnus viscidiflorus	Asteraceae	Native		
Cichorium intybus	Asteraceae	Exotic		
Cirsium Mohavense	Asteraceae	Native		
Cleomella obtusifolia	Capparaceae	Native		
Cleomella parviflora	Capparaceae	Native		
Cordylanthus maritimus ssp. canescens	Scrophulariaceae	Native		
Coreopsis bigelovii	Asteraceae	Native		
Cressa truxillensis	Convolvulaceae	Native		
Cryptantha micrantha	Boraginaceae	Native		
Cryptantha pterocarya	Boraginaceae	Native		
Cuscuta californica var. californica	Cuscutaceae	Native		
Cuscuta sp.	Cuscutaceae	-		
Cynodon dactylon	Poaceae	Exotic		
Datisca glomerata	Datiscaceae	Native		
Datura wrightii	Solanaceae	Native		
Delphinium parishii ssp. parishii	Ranunculaceae	Native		
Descurainia pinnata ssp. glabra	Brassicaceae	Native		
Dichelostemma capitatum ssp. pauciflorum	Liliaceae	Native		
Distichlis spicata	Poaceae	Native		
Eleocharis parishii	Cyperaceae	Native		
Emmenanthe penduliflora	Hydrophyllaceae	Native		
Encelia virginensis	Asteraceae	Native		
Ephedra viridis	Ephedraceae	Native		
Epipactis gigantea	Orchidaceae	Native		
Eremalche exilis	Malvaceae	Native		
Eriastrum wilcoxii	Polemoniaceae	Native		

SCIENTIFIC NAME	FAMILY	ORIGIN	RARITY[1]	NOXIOUS CATEGORY[2]
Ericameria cooperi	Asteraceae	Native		
Ericameria linearifolia	Asteraceae	Native		
Eriogonum cernuum var. viminale	Polygonaceae	Native		
Eriogonum fasciculatum var. polifolium	Polygonaceae	Native		
Eriogonum inflatum var. inflatum	Polygonaceae	Native		
Eriogonum maculatum	Polygonaceae	Native		
Eriogonum pusillum	Polygonaceae	Native		
Eriogonum reniforme	Polygonaceae	Native		
Eriogonum sp.	Polygonaceae	-		
Eriophyllum pringlei	Asteraceae	Native		
Eriophyllum wallacei	Asteraceae	Native		
Erodium cicutarium	Geraniaceae	Exotic		
Eschscholzia minutiflora	Papaveraceae	Native		
Fraxinus velutina	Oleaceae	Native		
Gilia brecciarum ssp. neglecta	Polemoniaceae	Native		
Gilia cf. leptomeria	Polemoniaceae	Native		
Glycyrrhiza lepidota	Fabaceae	Native		
Glyptopleura marginata	Asteraceae	Native		
Gnaphalium luteo-album	Asteraceae	Exotic		
Grayia spinosa	Chenopodiaceae	Native		
Guillenia lasiophylla	Brassicaceae	Native		
Heliotropium curassavicum	Boraginaceae	Native		
Hordeum jubatum	Poaceae	Native		
Hordeum murinum ssp. glaucum	Poaceae	Exotic		
Hymenoclea salsola	Asteraceae	Native		
Juncus balticus	Juncaceae	Native		
Juncus bufonius	Juncaceae	Native		
Keckiella breviflora	Scrophulariaceae	Native		
Krascheninnikovia lanata	Chenopodiaceae	Native		
Lactuca serriola	Asteraceae	Exotic		
Larrea tridenta	Zygophyllaceae	Native		
Layia glandulosa	Asteraceae	Native		
Lepidium flavum var. flavum	Brassicaceae	Native		
Lepidium fremontii	Brassicaceae	Native		
Lepidium virginicum var. pubescens	Brassicaceae	Native		
Leptochloa fascicularis	Poaceae	Native		
Lessingia lemmonii var. ramulosissima	Asteraceae	Native		
Linanthus aureus	Polemoniaceae	Native		
Linanthus dichotomus	Polemoniaceae	Native		
Loeseliastrum matthewsii	Polemoniaceae	Native		
Lolium multiflorum	Poaceae	Exotic		Possible threat
Lomatium mohavense	Apiaceae	Native		
Lotus corniculatus	Fabaceae	Exotic		
Lupinus concinnus	Fabaceae	Native		
Lupinus excubitus	Fabaceae	Native		
Lupinus odoratus	Fabaceae	Native		
Lycium cooperi	Solanaceae	Native		
Malacothrix glabrata	Asteraceae	Native		

SCIENTIFIC NAME	FAMILY	ORIGIN	RARITY[1]	NOXIOUS CATEGORY[2]
Melilotus alba	Fabaceae	Exotic		
Menodora spinescens	Oleaceae	Native		
Mentzelia albicaulis	Loasaceae	Native		
Mimulus guttatus	Scrophulariaceae	Native		
Mimulus pilosus	Scrophulariaceae	Native		
Mirabilis bigeloviii var. retrorsa	Nyctaginaceae	Native		
Mirabilis multiflora	Nyctaginaceae	Native		
Monoptilon bellioides	Asteraceae	Native		
Muhlenbergia rigens	Poaceae	Native		
Muilla coronata (tentative ID)	Liliaceae	Native	List 4	
Nama demissum var. demissum	Hydrophyllaceae	Native		
Nama sp.	Hydrophyllaceae	Native		
Nitrophila occidentalis	Chenopodiaceae	Native		
Oenothera primiveris ssp. bufonis	Onagraceae	Native		
Opuntia basilaris var. basilaris	Cactaceae	Native		
Opuntia echinocarpa	Cactaceae	Native		
Parthenocissus vitacea	Vitaceae	Native		
Pectocarya penicillata	Boraginaceae	Native		
Petalonyx thurberi ssp. thurberi	Loasaceae	Native		
Phacelia fremontii	Hydrophyllaceae	Native		
Phacelia tanacetifolia	Hydrophyllaceae	Native		
Phragmites australis	Poaceae	Native		
Plagiobothrys arizonicus x canescens	Boraginaceae	Native		
Plagiobothrys parishii [3] *(tentative ID)*	Boraginaceae	Native	List 1B	
Plantago lanceolata	Plantaginaceae	Exotic		
Poa secunda ssp. secunda	Poaceae	Native		
Polygonum arenastrum	Polygonaceae	Exotic		
Polygonum hydropiperoides	Polygonaceae	Native		
Polygonum sp.	Polygonaceae	-		
Polypogon monspeliensis	Poaceae	Exotic		
Populus fremontii ssp. fremontii	Salicaceae	Native		
Portulaca oleracea	Portulacaceae	Exotic		
Psorothamnus arborescens var. minutifolius	Fabaceae	Native		
Quercus wislizenii	Fagaceae	Native		
Rafinesquia neomexicana	Asteraceae	Native		
Ranunculus sp.	Ranunculaceae	-		
Robinia pseudoacacia	Fabaceae	Exotic		List B
Rosa woodsii var. ultramontana	Rosaceae	Native		
Rumex crispus	Polygonaceae	Exotic		
Salazaria mexicana	Lamiaceae	Native		
Salix exigua	Salicaceae	Native		
Salix gooddingii	Salicaceae	Native		
Salix laevigata	Salicaceae	Native		
Salsola tragus	Chenopodiaceae	Exotic		Unknown
Salvia columbariae	Lamiaceae	Native		
Salvia dorrii	Lamiaceae	Native		
Sarcobatus vermiculatus	Chenopodiaceae	Native		

SCIENTIFIC NAME	FAMILY	ORIGIN	RARITY[1]	NOXIOUS CATEGORY[2]
Schismus arabicus	Poaceae	Exotic		Possible threat
Scirpus americanus	Cyperaceae	Native		
Scirpus nevadensis	Cyperaceae	Native		
Sidalcea covillei[3]	Malvaceae	Native	List 1B; SE	
Sisymbrium altissimum	Brassicaceae	Exotic		
Sisyrinchium bellum	Iridaceae	Native		
Sphaeralcea ambigua var. rugosa	Malvaceae	Native		
Sporobolus airoides	Poaceae	Native		
Stanleya pinnata	Brassicaceae	Native		
Streptanthella longirostrus	Brassicaceae	Native		
Tamarix ramosissima	Tamaricaceae	Exotic		List A-1
Taraxacum officinale	Asteraceae	Exotic		
Tetradymia stenolepis	Asteraceae	Native		
Thysanocarpus curvipes	Brassicaceae	Native		
Tiquilia nuttallii	Boraginaceae	Native		
Tricardia watsonii	Hydrophyllaceae	Native		
Trifolium repens	Fabaceae	Exotic		
Trifolium wormskioldii	Fabaceae	Native		
Triglochin concinna var. debilis	Juncaginaceae	Native		
Typha x glauca	Typhaceae	Native		
Ulmus sp.	Ulmaceae	-		
Urtica dioica ssp. holosericea	Urticaceae	Native		
Veronica anagallis-aquatica	Scrophulariaceae	Exotic		
Veronica sp.	Scrophulariaceae	-		
Vulpia microstachys var. pauciflora	Poaceae	Native		
Xanthium strumarium	Asteraceae	Native		
Xylorhiza tortifolia var. tortifolia	Asteraceae	Native		
Yucca brevifolia	Liliaceae	Native		

[1] California Native Plant Society: List 1B = "Plants rare, threatened, or endangered in California and elsewhere." List 2 = "Plants rare, threatened, or endangered in California, but more common elsewhere." List 4 = "Plants of limited distribution—a watch list." SE = State endangered.

[2] California Exotic Pest Plant Council: List A-1 = Most invasive wildland pest plants (widespread); List A-2, = Most invasive wildland pest plants (regional); List B = Wildland pest plants of lesser invasiveness; Possible threat = pose significant threats to wildlands but do not qualify for Lists A or B; Unknown = more information needed.

[3] Outside boundary of study area.

Appendix D. Vertebrate wildlife species observed in the project area

Scientific name	Common name
Mammals	
Ammospermophilus leucurus	Antelope ground squirrel
Antrozous pallidus	Pallid bat
Canis latrans	Coyote
Chaetodipus formosus	Long-tailed pocket mouse
Dipodomus merriami	Merriam's kangaroo rat
Dipodomys microps	Great Basin kangaroo rat
Euderma maculatum	Spotted bat
Lepus californicus	Black-tailed hare
Mephitis mephitis	Striped skunk
Microtus californicus	California vole
Mustela frenata	Long-tailed weasel
Myotis ciliolabrum	Small-footed myotis
Myotis evotis	Long-eared myotis
Myotis thysanodes	Fringed myotis
Myotis volans	Long-legged bat
Myotis yumanensis	Yuma myotis
Neotoma fuscipes	Dusky-footed woodrat
Neotoma lepida	Desert wood rat
Onychomys torridus	Southern grasshopper mouse
Perognathus longimembris	Little pocket mouse
Peromyscus maniculatus	Deer mouse
Peromyscus truei	Pinyon mouse
Reithrodontomys megalotis	Western harvest mouse
Spermophilus beecheyi	Beechey ground squirrel
Spermophilus Mohavensis	Mohave ground squirrel
Sylvilagus audubonii	Desert cottontail
Thomomys bottae	Botta's pocket gopher

Birds	
Scientific name	**Common name**
Accipiter cooperi	Coopers hawk
Aeronautes saxaitalis	White-throated swift
Agelaius phoeniceus	Red-winged blackbird
Aimophila ruficeps	Rufous-crowned sparrow
Amphispiza belli	Sage sparrow
Amphispiza bilineata	Black-throated sparrow
Aquila chrysaetos	Golden eagle

Birds	
Scientific name	**Common name**
Archiliocus alexandri	Black-chinned hummingbird
Baeolophus inornatus	Plain Oak titmouse
Buteo jamaicensis	Red-tailed hawk
Callipepla californica	California quail
Calypte costae	Costa's hummingbird
Carduelis psaltria	American goldfinch
Carpodacus mexicanus	House finch
Cathartes aura	Turkey vulture
Catharus guttatus	Hermit thrush
Certhis americana	Brown creeper
Chaetura vauxi	Vaux's swift
Charadrius vociferous	Killdeer
Chordeiles acutipennis	Lesser nighthawk
Chordeiles minor	Common nighthawk
Chordeiles minor	Common nighthawk
Circus cyaneus	Northern harrier
Colaptes auratus	Northern flicker
Columbia livia	Rock dove
Corvus corax	Common raven
Corvus corax	Common raven
Dendroica coronata	Yellow-rumped warbler
Dendroica nigrescens	Black-throated gray warbler
Dendroica townsendi	Townsend's warbler
Empidonax oberholseri	Dusky flycatcher
Empidonax wrightii	Grey flycatcher
Euphagus cyanocephalus	Brewer's blackbird
Falco sparverius	American kestrel
Geococcys californianus	Greater roadrunner
Geothlypis trhchas	Common yellowthroat
Hirundo pyrrhonota	Cliff swallow
Hirundo rustica	Barn swallow
Icterus galbula	Northern oriole
Junco hyemalis	Dark-eyed junco
Lanius ludovicianus	Loggerhead shrike
Larus californicus	California gull
Melanerpes lewis	Lewis' woodpecker
Melospiza lincolnii	Lincoln's sparrow
Melospiza melodia	Song sparrow
Moloathrus ater	Brown-headed cowbird
Mumus polyglottos	Northern mockingbird
Myiarchus cinerascens	Ash-throated flycatcher

Birds	
Scientific name	**Common name**
Myiarchus cinerascens	Ash-throated flycatcher
Oporornis tolmiei	MacGillivray's warbler
Passer domesticus	House sparrow
Passerculus sandwichensis	Savannah sparrow
Pelecanus erythrorhynchos	American white pelican
Phalaenoptilus nutallii	Common poorwill
Pica pica	Black-billed magpie
Piranga ludoviciana	Western tanager
Piranga rubra	Summer tanager
Polioptila caerulea	Blue-gray gnatcatcher
Quiscalus mexicanus	Great-tailed grackle
Regulus calendula	Ruby-crowned kinglet
Salpinctes obsoletus	Rock wren
Sayornis saya	Say's phoebe
Sialia curruccoides	Mountain bluebird
Sphyrapicus ruber	Red-breasted sapsucker
Spizella breweri	Brewer's sparrow
Spizella passerina	Chipping sparrow
Stelgidopterix serripennis	Northern rough-winged swallow
Sternella neglecta	Western meadowlark
Sturnus vulgaris	European starling
Tachycineta bicolor	Tree swallow
Tachycineta thalassina	Violet-green swallow
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	House wren
Turdus migratorius	American robin
Tyrannus verticalis	Western kingbird
Vermivora celata	Orange-crowned warbler
Vermivora ruficapilla	Nashville warbler
Vireo cassinii	Cassin's vireo
Wilsonia pusilla	Wilson's warbler
Zonotrichia leucophrys	White-crowned sparrow

Reptiles	
Scientific name	**Common name**
Callisaurus draconoides	Zebra-tailed lizard
Chionactis occipitalis	Western shovel-nosed snake
Cnemidophorus tigris	Great basin whiptail
Crotaphytus insularis	Collared lizard
Dipsosaurus dorsalis	Desert iguana
Gambelia wislizenii	Long-nosed leopard lizard

Reptiles	
Scientific name	**Common name**
Gopherus agassiziii	Desert tortoise
Lampropeltis getulus	Common kingsnake
Masticophis flagellum	Coachwhip
Mastigophis flagellum piceus	Red Coachwhip
Phrynosoma platyrhinos	Desert horned lizard
Sceloporus magister	Desert spiny lizard
Uta stansburiana	Side-blotched lizard

Appendix E. Biological Evaluation

Olancha/Cartago Four-Lane Project

Inyo County, California

09-INY-395-KP 50/67.2 (PM 30.8/41.8)

EA 09-213400

JUNE 2003

For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Tom Dayak, Eastern Sierra Environmental Branch, 500 South Main Street, Bishop, CA 93514; (760)872-0690 Voice, or use the California Relay Service TTY number, (760) 872-9043.

Biological Evaluation

Olancha/Cartago Four-lane Project
Inyo County, California
09-INY-395-KP 50/67.2 (PM30.8/41.8)
EA 09-213400

JUNE 2003

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration, and
THE STATE OF CALIFORNIA
Department of Transportation

Approved By: Wendy Philpott Date: 6/11/03
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District 9
District 9, Central Region

Approved By: Tom Dayak Date: 6/13/03
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California Department of Transportation

Summary of Findings, Conclusions, and Determinations

Caltrans proposes to widen approximately 17.9 km (11.1 mi) of U. S. Highway 395 in southern Inyo County to four lanes. The Owens tui chub, Owens pupfish, desert tortoise, and least Bell's vireo do not occur in the study area and thus will not be affected by the proposed project. No aquatic habitat exists to support fish, and project alternatives were designed to avoid effects to hydrology and wetlands. The project is probably north of the native range of the desert tortoise; the one adult desert tortoise documented in the project area was likely an escaped captive. Swainson's hawk occasionally nests in trees within 1 km (0.6 mi) of the project; if the one alternative that involves tree removal is selected, replacement trees will be planted as close as possible in a 2:1 ratio. Mohave ground squirrels do occur in the project area. Loss of Mojave ground squirrel habitat, which varies from 20.6 ha (50.8 ac) to 34.1 ha (84.3 ac) by alternative will be mitigated at a 3:1 ratio.

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List of Abbreviated Terms

Caltrans	California Department of Transportation
CDFG	California Department of Fish and Game
FHWA	Federal Highway Administration
ft	foot/feet
km	Kilometer(s)
KP	Kilometer post
m	meter(s)
mi	mile(s)
PM	Post mile
USFWS	United States Fish and Wildlife Service

1. Introduction

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) are proposing a new four-lane highway in Inyo County on Highway 395 near the towns of Olancha and Cartago. The purpose of this biological assessment is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the proposed project may affect threatened, endangered, or proposed species. The Biological Assessment is prepared in accordance with legal requirements found in Section 7 of the Endangered Species Act (16 U.S. C 1536(c)) and with Federal Highway Administration and California Department of Transportation regulation, policy and guidance. The document presents technical information upon which later decisions regarding project impacts are developed.

2. Project History

2.1. Background

The Olancha/Cartago Four-lane Project is listed in the 2001 Inyo County Regional Transportation Plan, as is the need to four-lane the rest of Route 395 in Inyo County. The plan states that "The Local Transportation Commission concurs with these System Planning concepts and reaffirms its recommendations that the Route 14/395 be recognized as being of statewide significance and that the major portions of these two routes be upgraded to four lanes." The route concept, as described in the U.S. 395 Transportation Concept Report (TCR, dated May 2000), is to improve U.S. Highway 395 in Inyo County to a four-lane, controlled access highway with a level of service of "C" or better. U.S. Highway 395 is recognized by the District System Management Plan as one of the two major transportation corridors in the District. The focus of the District System Management Plan is to "continue upgrading U.S. Highway 395 corridor to a four-lane facility" from the Los Angeles and San Bernardino County lines to Lee Vining in Mono County. With the completion of the proposed Black Rock 4-Lane project, the Independence 4-Lane project, the Manzanar 4-Lane project, and the Olancha Cartago 4-Lane project, a continuous four-lane expressway section will be achieved from the Kern/Inyo County line to the end of the completed Rush Creek 4-Lane project at KP 82.6 (PM 51.3) in Mono County.

U.S. 395 is a high-emphasis route in the Inter-Regional Road System. It is a major element of a transportation corridor connecting the Eastern Sierra Region (Inyo and Mono counties) and Western Central Nevada to the Southern California region (Figure E-1). This transportation corridor has been identified in previous California planning studies as one of five major recreational corridors serving all of Southern California and one of eleven major regional transportation corridors in California. As a transportation corridor it serves several purposes. First, the highway corridor is vital for the economy of the Eastern Sierra region for the shipment of goods and materials. The region imports virtually all of its food, clothing and other goods. Secondly, this corridor has major recreational use as evidenced by over seven million visitor-days of recreation generated annually in the Eastern High Sierra. An Origination and Destination Travel Study conducted in 2000 for Route 395 through Inyo and Mono counties indicated that 68% of the non-commercial traffic was recreationally oriented and was composed of 4.3% recreational vehicles. It also indicated that 36% of all vehicles coming into the Eastern Sierra Region originated from Southern California, with average personal vehicle occupancy of 2.5 persons.

The Inyo and Mono County Local Transportation Commissions, Caltrans, the City of Bishop, and the Town of Mammoth Lakes recognize the importance that U.S. Highway 395 has on the tourist trade for the region and strongly support this improvement. A coalition of Regional Transportation Planning Agencies (RTPAs) consisting of Inyo County Local Transportation Commission, Mono County Local Transportation Commission, and Kern Council of Governments was formed with the prospect of jointly funding this and other projects.This project was submitted during the 1998 State Transportation Improvement Program amendment cycle as a jointly funded RTIP/ITIP project, with Kern, Inyo, and Mono counties pooling RTIP funds, long with 40% of the funds from ITIP.

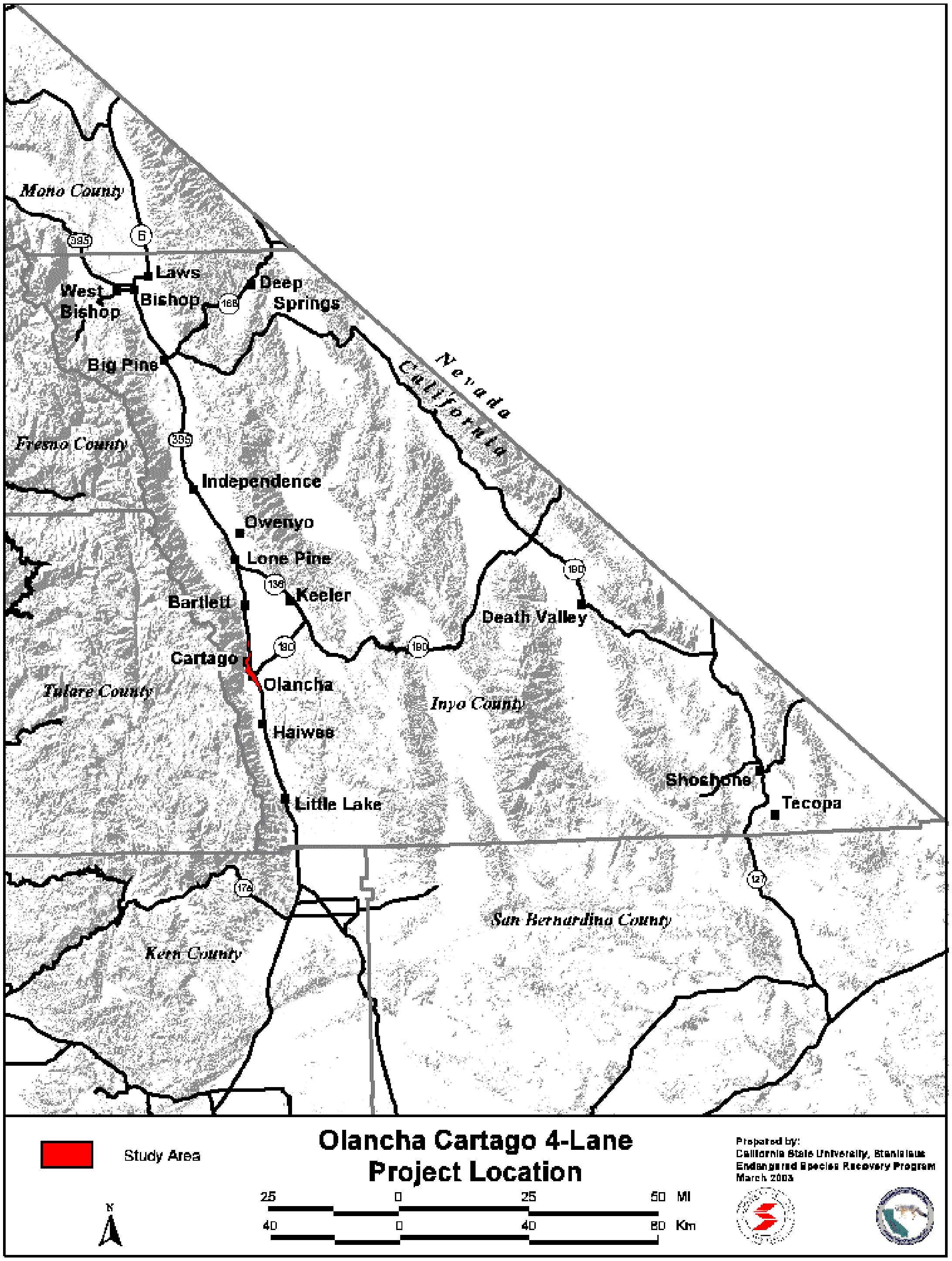

Figure E-1. Project location.

2.2. Purpose and Need:

The existing roadway is a two-lane, undivided, conventional highway with 3.6-m (12-ft) lanes and 1.2-m (4-ft) shoulders, currently operating at a level of service D. Passing opportunities are restricted by barrier striping through approximately 58% of this segment. This segment of U.S. Highway 395 is bordered by a four-lane expressway to the north and south, both containing 30.5-m (100-ft) medians.

The proposed project would improve the level of service of the existing facility, provide increased capacity to meet present and future traffic demands, and ease peak traffic congestion and queuing by expanding the existing highway to a four-lane expressway. The proposed project would:

Remove passing restrictions,
Separate opposing traffic,
Provide adequate shoulder widths for disabled vehicles and bicycle traffic,
Provide for emergency parking areas,
Improve drainage, and
Improve route continuity.

The proposed project would address all deficiencies of the existing facility. All features would meet current standards for a design speed of 130 kph (80 mph).

A pavement deflection study was conducted in March and April of 1998. The study revealed that the existing pavement needs corrective measures. Pavement condition has deteriorated throughout the majority of the proposed project limits, with continuous transverse cracking and segments of severe alligator “B” cracking.

With the construction of the Olancha/Cartago Four-lane, the goal of four lanes for U.S. Highway 395 in Inyo County will be met. The completion of this four-lane facility will bring the level of service up to A for the 20-year planning period. Without improvement, this segment will deteriorate to level of service E by 2010. Construction of the project would bring this segment of U.S. 395 to current expressway standards, improve route continuity, and meet the route concept for Inyo County.

3. Project Description

The project is located in Inyo County, on Highway 395 near the towns of Olancha and Cartago (Figure E-1). The southern end of the project is just south of the Los Angeles Aqueduct Bridge No. 48-10 at KP 49.6 (PM 30.8). The project extends north to the existing four-lane segment at the Ash Creek Bridge No. 48-11 at KP 67.4 (PM 41.9). The project is approximately 17.9 km (11.1 mi) long. The alternatives propose include five build alternatives and one no-action alternative (Figure E-2, Appendix A).

3.1. Actions Common to Alternatives 1, 2, 2a, 3, and 3a

Construct two or four new travel lanes, depending on alternative, with a median separating direction of travel, and outside shoulder widths of 3 m (10 ft).

A median width varying from 24.4 m (80 ft) to 30.5 m (100 ft) for expressway segments of build alternatives (the median width of alternative 1 is 3.5 m (14 ft) paved)

Rehabilitate and bring the existing traveled way up to standard

Construct right- and left-turn lanes where necessary or required by design standards

Correct road connections, bringing them up to current Caltrans Standards

Improve drainage

A new bridge (#48-0010) will cross the Los Angeles Aqueduct to provide a 30-m (100-ft) median. Proposed bridge location is at approximately KP 50.3 (PM 31.3)

Direct access and/or frontage roads will be provided for any land-locked properties.

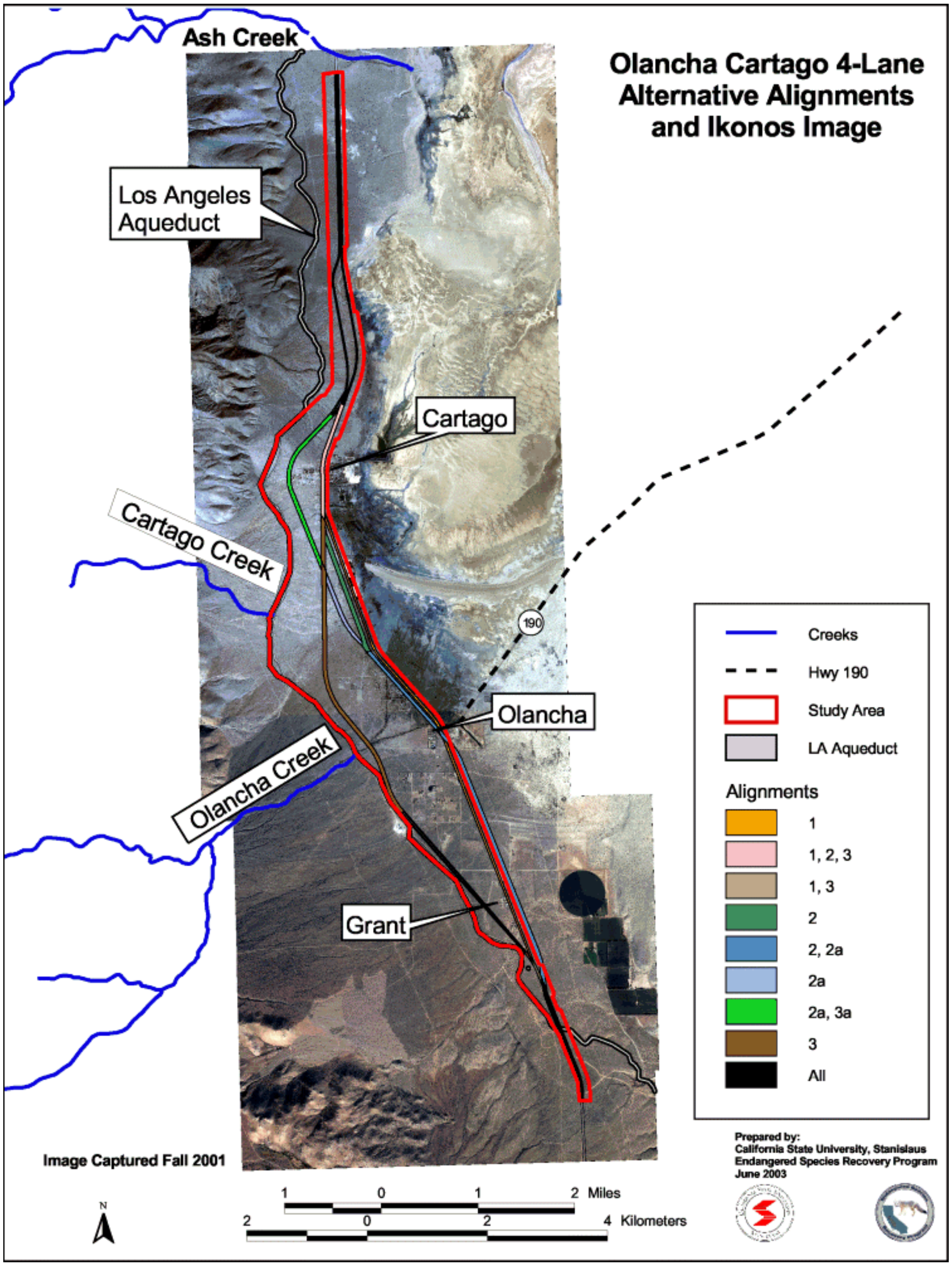

Figure E-2. Project study area and proposed alignments.

3.2. Alternative 1

This alternative would widen the existing highway to a four-lane facility. The new facility would contain characteristics of both a controlled access expressway and a rural conventional highway (Figure E-2, Appendix A).

- From KP 49.6 (PM 30.8) to approximately KP 51.7 (PM 32.1), the proposed alignment would have controlled access with a 30.5-m (100-ft) unpaved median and 3-m (10-ft) outside paved shoulders. New northbound lanes would be constructed east of the existing highway, which would be used for southbound traffic.
- From approximately KP 51.7 (PM 32.1) to approximately KP 55.8 (PM 34.7), the proposed alignment would be a rural conventional highway segment with a 4.2-m (14-ft) paved median and 3-m (10-ft) outside paved shoulders. New northbound lanes would be constructed east of the existing highway, which would be used for southbound lanes.
- From approximately KP 55.8 (PM 34.7) to approximately KP 61.8 (PM 38.4), the proposed alignment would be a rural conventional highway segment with a 4.2-m (14-ft) paved median and 3-m (10-ft) outside paved shoulders. New southbound lanes would be constructed west of the existing highway, which would be used for northbound lanes.
- From approximately KP 61.8 (PM 38.4) to approximately KP 64.0 (PM 39.8), the proposed alignment would be a rural conventional highway segment with the southbound lanes split from the northbound lanes, 3-m (10-ft) outside paved shoulders, and 1.5-m (5-ft) inside paved shoulders. An approximately 204-m (670-ft) centerline separation would split the alignments in an effort to avoid utility and wetland effects. New southbound lanes would be constructed west of the existing highway, which would be used for northbound lanes.
- From approximately KP 64.0 (PM 39.8) to approximately KP 66.9 (PM 41.6), the proposed alignment would have controlled access with a 30.5-m (100-ft) unpaved median and 3-m (10-ft) outside paved shoulders. New northbound lanes would be constructed east of the existing highway, which would be used for southbound lanes.

3.3. Alternative 2

This alternative is a four-lane, divided, controlled access expressway with an unpaved median varying in width from 24.4 m (80 ft) to 30.5 m (100 ft) (Figure E-2, Appendix A).

This alternative would utilize the existing highway from KP 49.6 (PM 30.8) to KP 50.9 (31.6) for northbound traffic, and new southbound lanes would be constructed west of the existing lanes.

From KP 50.9 (PM 31.6) to KP 60.0 (PM 37.3), new north and southbound lanes would be constructed to expressway standards. The new lanes would be constructed east of the existing alignment from KP 50.9 (31.6) to just south of the Rte 190 junction, KP 55.8 (PM 34.7). The existing highway would be utilized as a new frontage road and would be relinquished to Inyo County.

From KP 55.8 (PM 34.7) to KP 60.0 (PM 37.3), the median width is 24.4 m (80 ft).

Just south of the Rte 190 junction, the new alignment would transition over and be built west of the existing highway until KP 60.0 (PM 37.3). The existing highway will be utilized as a new frontage road and would be relinquished to Inyo County.

From approximately KP 60.0 (PM 37.3) to approximately KP 61.8 (PM 38.4), the proposed alignment would have controlled access with a 30.5-m (100-ft) unpaved median and 3-m (10-ft) outside paved shoulders. New southbound lanes would be constructed west of the existing highway, which would be used for northbound lanes.

From approximately KP 61.8 (PM 38.4) to approximately KP 64.0 (PM 39.8), the proposed alignment would have controlled access with the southbound lanes split from the northbound lanes, 3-m (10-ft) outside paved shoulders, and 1.5-m (5-ft) inside paved shoulders. An approximately 204-m (670-ft) centerline separation would split the alignments in an effort to avoid utility and wetland effects. New southbound lanes would be constructed west of the existing highway, which would be used for northbound lanes.

From approximately KP 64.0 (PM 39.8) to KP 66.9 (PM 41.6), the proposed alignment would have controlled access with a 30.5-m (100-ft) unpaved median and 3-m (10-ft) outside paved shoulders. New northbound lanes would be constructed east of the existing highway, which would be used for southbound lanes.

3.4. Alternative 2a

Alternative 2a is identical to Alternative 2 in terms of the type of facility that is being proposed. It also proposes to construct a controlled access expressway. The only difference in design between Alternative 2 and 2a is that Alternative 2 passes through Cartago while Alternative 2a bypasses Cartago by shifting the proposed highway alignment west and around Cartago following an existing railroad grade (Figure E-2, Appendix A).

Alternative 2a is identical to Alternative 2 until it reaches KP 57.9 (PM 36). At approximately KP 57.9 (PM 36), instead of the new alignment, it would transition to the west to meet an existing railroad grade and would continue around Cartago paralleling the existing highway. The new alignment would continue west of Cartago and transition back to the existing alignment near KP 61.9 (PM 38.5). From this point north, Alternative 2a is identical to Alternative 2.

3.5. Alternative 3

Alternative 3 comprises a four-lane divided expressway west of the existing U.S. Highway 395 corridor (Figure E-2, Appendix A). This alternative proposes an alternative alignment that bypasses the community of Olancha by shifting the new highway corridor west of the community. This alternative would utilize the existing highway from KP 49.6 to KP 50.9 (PM 30.8 to PM 31.6) for southbound traffic and new northbound lanes would be constructed east of the existing lanes. From KP 50.9 (PM 31.6) new north and southbound lanes would be constructed generally paralleling the Los Angeles Aqueduct for approximately 9.5 km (5.9 mi) and then heading due north to intersect with the existing alignment in Cartago at KP 60.0 (PM 37.3). From Cartago north, Alternative 3 is identical to Alternative 2.

With this alternative, it is desirable to extend State Route 190, a rural conventional highway, approximately 1.3 km (0.8 mi) to the west to join the new alignment. This would allow the relinquishment of the existing U.S. 395 highway between KP 50.9 to KP 60.0 (PM 31.6 to PM 37.3) to the County of Inyo.

Direct Access and/or frontage roads would be provided for any land locked properties.

3.6. Alternative 3a

Alternative 3a is identical to Alternative 3 except it does not intersect with the existing alignment in Cartago at KP 60.0 (PM 37.3) (Figure E-2, Appendix A). Like Alternative 2a, Alternative 3a bypasses Cartago by following an existing railroad grade around and west of Cartago. It would transition back to the existing highway alignment at the same location depicted in Alternative 2a north of Cartago, near KP 61.9 (PM 38.5). From this point north, Alternative 3a would be identical to Alternative 3.

3.7. Alternative 4

“No Build.”

3.8. Summary of Consultation to Date

In a June 18, 2002 response to a letter from Wendy Philpott, District 9 biologist with Caltrans, requesting information on threatened and endangered species that may be present near the proposed Olancha/Cartago Four-lane project, Diane K. Noda, Field Supervisor with the USFWS in Ventura, California, included three species. She wrote "The federally endangered least Bell's vireo (*Vireo bellii pusillus*), Owen's tui chub (*Gila bicolor snyderi*), and the Owen's pupfish (*Cyprinodon radiosus*) are the only federally listed species known to occur in the area" (Appendix F). In addition to these species, this document addresses the desert tortoise (*Gopherus agasizzi*), listed as threatened by the federal government and the State of California, and the Swainson's hawk (*Buteo swainsoni*) and the Mohave ground squirrel (*Spermophilus mohavensis*), listed as threatened by the State of California.

3.9. Preparation History

This document was prepared by Thomas E. Kucera, Endangered Species Recovery Program, California State University, Stanislaus. It is based on work conducted with the preparation for Caltrans of a Natural Environment Study for the Olancha/Cartago Four-lane Project.

3.10. Listed and Proposed Species Potentially in the Project Area

Table E-1: Listed and Proposed Species Potentially Occurring in the Project Area.

Scientific Name	Common Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Gila bicolor snyderi	Owens tui chub	FE SE	Streams, spring-fed ponds	A	Streams, spring-fed ponds absent
Cyprinodon radiosus	Owens pupfish	Fed: END Calif:END S1, FP	Streams, clear ponds	A	No water present
Gopherus agassiziii	Desert tortoise	FT ST	Creosote scrub and other desert scrub	P	Habitat may be present; probably north of its native range
Buteo swainsoni	Swainson's hawk	ST	Nests in trees in open habitats	P	Present
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	SE	Nests in dense riparian forest	A	No dense riparian forest present
Empidonax trailii	Willow flycatcher	FE SE	Nests in dense willow riparian vegetation	A	No dense willow riparian vegetation
Vireo belli pusillus	Least Bell's vireo	FE SE	Riparian forests and willow scrub	A	No riparian forests and willow scrub
Riparia riparia	Bank swallow	ST	Nests in colonies in riverbanks, cliffs, and road cuts	A	No riverbanks, cliffs, or road cuts
Spermophilus mohavensis	Mohave ground squirrel	FSS ST	Mohave desert scrub	P	

Absent [A] means no further work needed. Present [P] means general habitat is present and species may be present. Status: Federal Endangered (FE); Federal Threatened (FT); Federal Proposed (FP, FPE, FPT); Federal Candidate (FC), Federal Species of Concern (FSC); State Endangered (SE); State Threatened (ST); Fully Protected (FP); State Rare (SR); State Species of Special Concern (SSC)

4. Study Methods

4.1. Studies Required

Table E-2: Listed and Proposed Species Potentially Occurring in the Project Area Needing Study.

Scientific Name	Common Name	Status	General Habitat Description	Species Present/ Absent	Rationale
Gopherus agassiziii	Desert tortoise	FT ST	Creosote scrub and other desert scrub	A	Probably north of its native range
Buteo swainsoni	Swainson's hawk	ST	Nests in trees in open habitats	P	Present
Spermophilus mohavensis	Mohave ground squirrel	FCS ST	Mohave desert scrub	P	Detected in surveys

Absent [A] means no further work needed. Present [P] means general habitat is present and species may be present. Status: Federal Endangered (FE); Federal Threatened (FT); Federal Proposed (FP, FPE, FPT); Federal Candidate (FC), Federal Species of Concern (FSC); State Endangered (SE); State Threatened (ST); Fully Protected (FP); State Rare (SR); State Species of Special Concern (SSC)

The Owens tui chub and Owens pupfish are fish species that inhabit standing or slowly-flowing, permanent water. None of that habitat occurs within the project area. Caltrans has designed all alternatives to avoid wetlands and hydrological alterations, thus there will be no effects to either of these species from any alternative and no further work was conducted on them.

No specific work was conducted on the western yellow-billed cuckoo, the willow flycatcher, the least Bell's vireo, or the bank swallow because no habitat appropriate for these species occurs in the project area. The western yellow-billed cuckoo inhabits dense riparian forests. The willow flycatcher requires dense willow riparian vegetation. The least Bell's vireo requires riparian forests and willow scrub. The bank swallow nests in colonies in riverbanks, cliffs, and road cuts. Because none of these habitats occurs in the project area, the assumption is that the species do not occur there, and thus there will be no effects to any of these species from any alternative, and no further work was conducted on them.

Focused surveys were conducted for desert tortoises, Swainson's hawks, and Mohave ground squirrels.

Focused Surveys for Desert Tortoises

Planned survey protocol was consistent with USFWS standard desert tortoise survey protocol (U.S. Department of the Interior (USDI) USFWS 1992) and consisted of walking 100% of the project site, using adjacent, 7.6-m (30-ft) wide transects. Buffer transects, consisting of single, 7.6 m (30-ft) transects walked at 30.5, 91.5, 183, 366, and 732 m (100, 300, 600, 1200, and 2400 ft) from and parallel to the project site were also planned. The purpose of buffer transects (also called “zone of influence” transects by USFWS) is to sample areas adjacent to the project site in order to determine if habitat conditions and abundance of tortoises are similar to those on the project right-of-way. This permits a more thorough estimate of effects from project construction and operation. Surveys were conducted between June 20 and 22, 2001, to coincide with maximum sign accumulation. This protocol was approved by the USFWS (G. Walker, USFWS Barstow Field Office, pers. comm. to A. Karl, March 14, 2001).

Upon meeting the morning of June 20, we determined that the survey area would be substantially reduced due to limited property access. Those properties with permitted access were surveyed using a 100 % cover (Figure E-3). No buffer transects were walked due to access constraints. On all surveys, tortoise surveyors were instructed to record and describe (e.g., size, age, gender associations) all tortoise sign (e.g.,

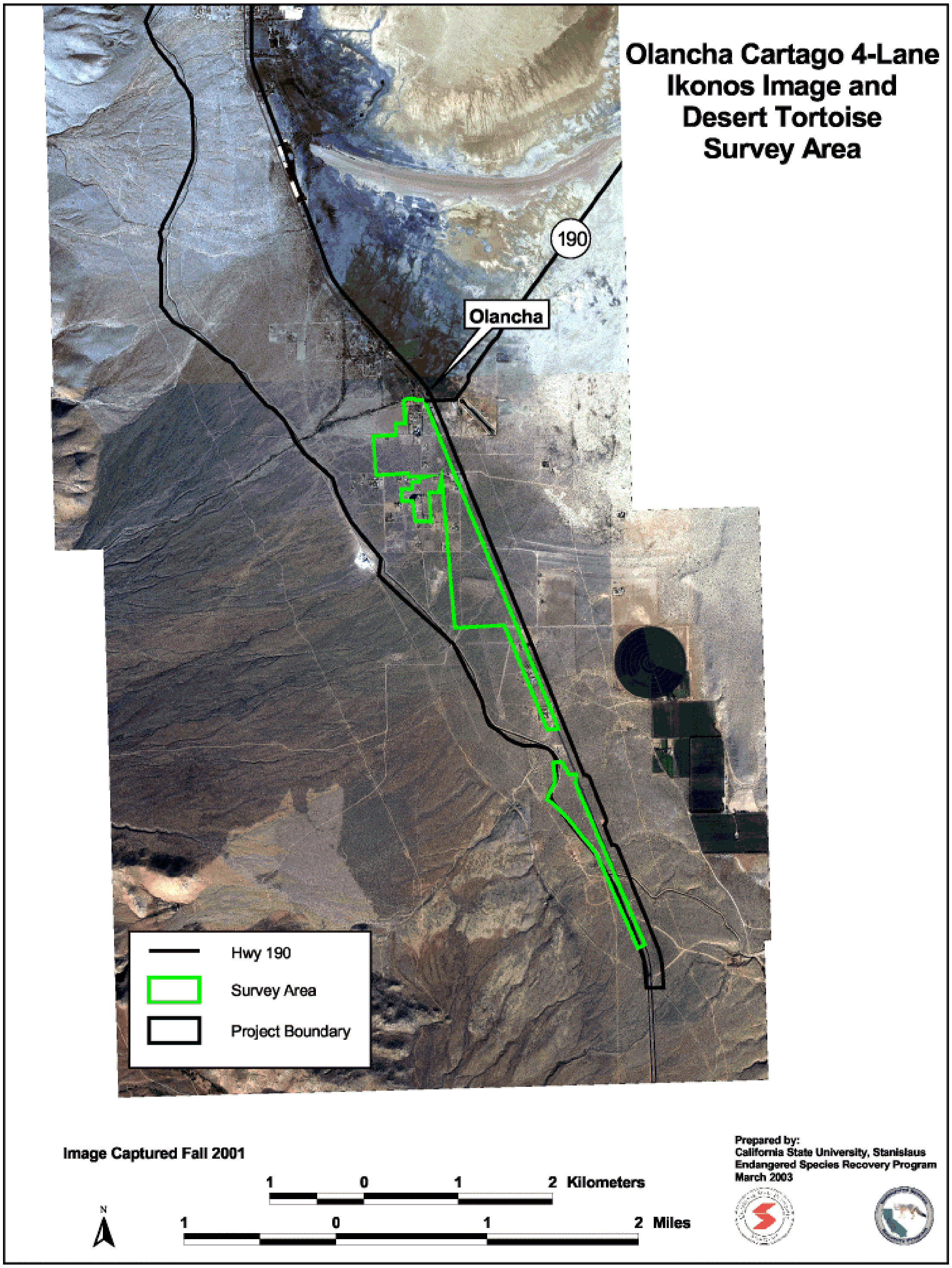

Figure E-3. Area surveyed for desert tortoises.

individuals, dens, burrows, scat, tracks, pellets, skeletal remains). The survey area was photo-documented and described relative to topography, drainage type, soils, substrate, aspect-dominant, common and occasional plant species, plant cover (estimated visually), and anthropogenic disturbances. While the surveys targeted desert tortoises, an inventory was also kept of all plant and animal species observed or detected during the survey.

Focused Surveys for Swainson's Hawks

There are no published protocols for conducting surveys for Swainson's hawks. However, we did obtain survey recommendations from the California Department of Fish and Game (Ron Schlorff pers. comm.) and the Swainson's hawk Technical Advisory Committee (Michael Bradbury pers. comm.). It was recommended that surveys be conducted from mid-March to mid-April to detect staging pairs. Swainson's hawks rarely establish a nest after this period, and they exhibit great fidelity to nest sites. Morning surveys are preferred (sunrise to 2 hr after sunrise), although evening surveys (1 hr before sundown until dark) may be successful because Swainson's hawks are likely to be sitting in their staging trees at those times. Surveys during mid-day are less successful because Swainson's hawks typically soar high and far from nest sites. Surveys conducted after mid-April are generally not productive because tree foliage tends to obscure nests and perching hawks, and because females become rather silent after laying eggs and while brooding. Males are often inconspicuous when returning to the nest with food.

On 18 and 24 March 2001, before the trees had leafed out, from 0630 to 0930 and 1600-1800, we examined the project area from a vehicle and on foot for stick nests in trees, and for Swainson's hawks and other raptors present. We also watched for raptors during other fieldwork (e.g., Mohave ground squirrel trapping, desert tortoise surveys) in the area during April, May, and June.

Focused Surveys for Mohave Ground Squirrels

A two-day reconnaissance of the project area was carried out on January 27-28, 2001. This comprised a visual assessment of habitat on undeveloped lands within 1.6 km (1 mi) of the existing alignment of U.S. Highway 395 between the Los Angeles Aqueduct Bridge No. 48-10 and the Ash Creek Bridge No. 48-11, a distance of approximately 17 km (10.5 m). This area was evaluated for its potential as Mohave ground squirrel habitat based on vegetation, soils, and slope. The reconnaissance indicated that habitat apparently suitable for the Mohave ground squirrel existed on undeveloped lands in those portions of the project area west of the current alignment of U.S. Highway 395. Much of this area is characterized by deep, fine-grained alluvial soils that provide a good substrate for rodent burrows. The vegetation is typical of that found in many areas of the western Mohave desert where Mohave ground squirrels have been reported. Saltbush species, such as shadscale (*Atriplex confertifolia*) and allscale (*A. polycarpa*), and creosote bush *(Larrea tridentata*) dominate the shrub community in the project area west of U.S. Highway 395. Shrub species richness is high throughout much of this area, with 15-19 shrub species noted at a number of sites. The shrub community includes winterfat (Krascheninnikovia lanata) and spiny hopsage (Grayia spinosa), two species known to be preferred forage plants for Mohave ground squirrels (Leitner and Leitner, 1998). Shrub cover appears to be relatively high over most of the area as well, with estimated cover values often in the range of 15-20 percent. These site characteristics are often associated with the presence of the Mohave ground squirrel.

Based on this reconnaissance, 10 sites were selected for trapping based upon habitat suitability, access, lack of development or human disturbance, and distribution throughout the length of the project area (Figure E-4). These sites were on undeveloped lands to the west of the existing U.S. Highway 395 alignment. Trapping grids were placed about 1.6 km (1 mi) apart and were selected to include all suitable habitats present within the study area. They occurred on lands owned by BLM and LADWP, and on private parcels whose owners had given written permission for access. All sites supported desert shrub communities that appeared to provide suitable habitat for the Mohave ground squirrel.

During 2002, based on the apparent absence of Mohave ground squirrels after negative trapping results in the study area during 2001 and after consultations with CDFG, we decided to extend our trapping efforts to the south., well out of the project area. This was an attempt to establish the location of the nearest Mohave ground squirrel population. We conducted a reconnaissance between the Los Angeles Aqueduct Bridge No. 48-10, the southern end of the Olancha/Cartago study area, and Coso Junction, a distance of about 25 km (15 mi). Based on soils, vegetation, and topography as described above, we identified three areas east of south of the Los Angeles Aqueduct Bridge No. 48-10, east of Hwy. 395, and west of Haiwee Reservoir in which to locate trap grids.

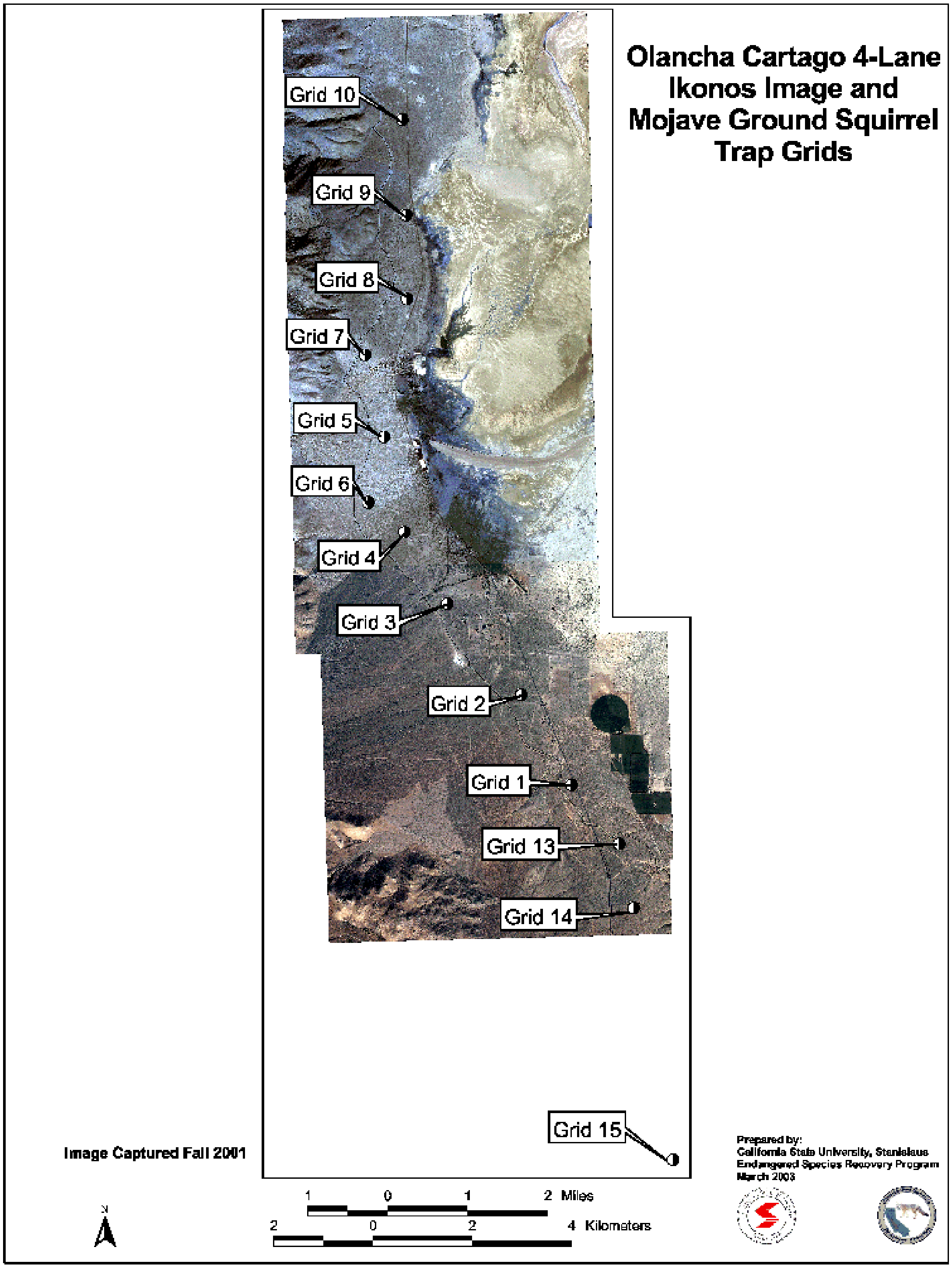

Figure E-4. Locations of trapping grids for Mohave ground squirrels.

The trapping grids comprised 100 trap stations arranged in four parallel lines of 25 stations each, with traps and traplines separated by 25 m (82 ft) in 2001 and 35 m (115 ft) in 2002. Field personnel set up each grid by pacing all distances and placing a wire flag at each trap station. A single Pymatuning, Sherman, or Tomahawk live trap was positioned near each trap station. During the April trapping sessions, all traps were placed under shrubs to provide shade. In May, cardboard covers were placed over traps. In 2001, each grid formed a rectangle measuring 75 x 600 m (246 x 1969 ft), with an area of 4.5 ha (11.1 ac). In 2002, each grid formed a rectangle of 105 x 850 m (2789 ft). The area actually sampled by each grid included a boundary strip around the outer trap stations. Mohave ground squirrels normally move at least 50 m (164 ft) during daily foraging activities, so that animals with home-range centers up to 50 m (164 ft) from the outer edges of the grid could encounter the traps. Thus, if a boundary strip of 50 m (164 ft) is assumed, each grid effectively sampled an area of about 12.2 ha (30 ac) in 2001 and 19.5 ha (48.1 ac) in 2002.

Traps were baited with a commercially available horse feed made up of a mixture of grains (oats, corn, wheat, and barley) coated with molasses. A powdered mixture of rolled oats and peanut butter was added to provide an odor. All ground squirrels captured were identified to species. When captured, Mohave ground squirrels and white-tailed antelope squirrels (*Ammospermophilus leucurus*) were marked on the belly with a red marking pen when possible, so that the number of individuals captured could be specified. They were examined for sex, age, and reproductive condition and then released at the point of captureDuring both the April and May sampling periods, trapping was carried out for five consecutive days on each of 10 trapping grids. In 2001, we trapped on grids 1 through 10 (Figure 3). During the first trapping session in 2002, we trapped on grids 1-4, 6, 7, 10, and three grids south of the study area, numbered 13, 14, and 15. During the second trapping session we trapped on grids 1-10. Traps were opened in the morning between 0745 and 0945 hours and closed in the afternoon between 1600 and 1800 hours.

Weather conditions were monitored during the sampling periods. The weather was generally favorable for this type of field survey. Daily high temperatures in April were generally 16^{o}-19^{o}C (60^{o}-67^{o}F), skies were clear to partly overcast, and winds on ranged from zero to about 5 m/sec (10 knots). A storm on April 9, 2001, reduced daily high temperatures to 10^{o}-13^{o}C (51^{o}-55^{o}F) and produced occasional snow flurries. On four days, wind speeds up to 10-12 m/sec (20-25 knots) were recorded, although these velocities were not sustained for more than a few hours. During May, weather conditions were also generally good. Daily maximum temperatures ranged from 27^{o}-36^{o}C (80^{o}-97^{o}F), skies were clear to partly overcast, and wind velocities ranged from zero to about 5 ms/sec (10 knots). On May 12, 2001, a storm resulted in a daily high of 22°C (72°F) and completely overcast skies with occasional light rain.

4.2. Personnel and Survey Dates

Desert tortoise surveys were conducted on 20-22 June, 2001, by :

- Alice Karl, task leader, Ph.D. Ecology, University of California, Davis, 1998; M.S. Environmental Biology, California State University, Northridge, 1982; B.A. Biology, California State University, Northridge 1976.
- Thomas Kucera, Project Manager, ESRP. Ph.D. in Wildland Resource Science, University of California, Berkeley, 1988. M.S. in Resource Ecology, the University of Michigan, 1976. B.A., Psychology and Zoology, Western Michigan University, 1969.
- Steve Boland. B.S. Environmental Biology, California State University, Fresno, 1985.
- Gilbert Goodlett, B.S. Engineering, Mississippi State University, 1987.
- Peggy Wood. M.S. Wildlife Ecology, Utah State University, 1986; B.S. Wildlife Science, Rutgers University, 1984.
- Erich Green. Tortoise observer since approximately 1998.
- David Roddy. B.S. Biology, University of California, Riverside, 1979.
- Mercy Vaughn. B.A. Ecology and Evolutionary Biology, University of Arizona, 1993.

Swainson's hawk surveys were conducted by Thomas Kucera on 18 and 24 March 2001. Additional information on Swainson's hawks was provided by Mr. Ron Schlorff of CDFG and Ms. Karen Sernka.

Livetrapping for Mohave ground squirrels was conducted during 1-13 April and 6-18 May 2001, and 26 March-5 April and 6-17 May 2002. Trapping was conducted according to conditions in Memoranda of Understanding between CDFG and Phillip Leitner, Thomas Kucera, and Patrick Kelly. The surveys were conducted by the following personnel:

- Phillip Leitner, Task Leader, 2001, ESRP. Ph.D. in Zoology, University of California, Los Angeles, 1961. M.A. in Zoology, 1960, University of California, Los Angeles. B.S. in Zoology, Saint Mary's College of California, 1958.

- Thomas Kucera
- Patrick Kelly, Coordinator, ESRP. Ph.D. in Integrative Biology, University of California, Berkeley, 1990
- Sean Avent, biologist, ESRP. M.A. in Marine Biology. San Francisco State University, 2002. B.S. in Biological Oceanography, University of Washington, 1996
- Tiffanie Brown, biologist, ESRP. B.S. in Zoology/Marine Biology, Humboldt State University, Arcata, 2000.
- Howard Clark, biologist, ESRP. M.S. in Biology, Fresno State University, 2001, B.S. in Biology, California State University, Stanislaus, 1998.
- Adam Harpster, biologist, ESRP. B.A. in Wildlife and Fisheries Science, The Pennsylvania State University, 1998.
- Noriko Kawamoto, biologist, ESRP. M.S. in Water Resources Management, 1983, University of Wisconsin, Madison. A.B. in Marine Biology, 1979, Occidental College, Los Angeles, California
- Kim Kreitenger, biologist, ESRP. B.A. in Biological Science, Northern Illinois University, De Kalb, Illinois, 1996.
- Brita Larsson, biologist, ESRP. M.S. in Biology, San Francisco State University, 1996. B.S. in Biology, California Polytechnic University, San Luis Obisbo, 1977
- Matt Lloyd, biologist, ESRP. M.S. in Biology, University of Wisconsin-Eau Claire, 2001; B.S. in Biology, 1999, University of Wisconsin-Eau Claire.
- Steve Messer, biologist, ESRP. B.S. in Biology, California State University, Fresno, 1998
- Patrick Morrison, biologist, ESRP. Undergraduate student, California State University, Fresno
- Darren Newman, biologist, ESRP. B.A. in Environmental Biology, California State University, Fresno, 1992.

- Henning Schreiber, biologist, ESRP. Ph.D. in Landscape Ecology, Faculty of Mathematics and Natural Science, Westfälische Wilhelms-University, Münster, 1997. M.S. in Geography, Department of Geography, Westfälische Wilhelms-University, Münster, 1991.

- Debbie Smith, biologist, ESRP. Ph.D. student, Univ. of Washington; M.S. in Integrative Biology, University of California, Los Angeles, 1997; B.S. Biological Science, Saint Mary's College of California, 1989.

- Foung Vang, biologist, ESRP. B.A. in Applied Ecology, University of California, Irvine, 1999.

4.3. Agency Coordination and Professional Contacts

The following professionals were contacted concerning sensitive wildlife species that could potentially occur in the project area:

Denyse Racine, Wildlife Biologist, CDFG, Bishop, California

Terry Russi, Wildlife Biologist, BLM, Bishop, California, 16 March 2001

George Walker, Wildlife Biologist, USFWS, Barstow, California, 4 October 2001

John Gustafson, Wildlife Biologist, CDFG, Sacramento, California,

Ron Schlorff, Wildlife Biologist, CDFG, Sacramento, California, 12 March 2001

Darryl Wong, Supervisory Biologist, CDFG, Bishop, California, 16 March 2001

Karyn Sernka, Wildlife Biologist, Western EcoSystems Technology, Inc., 17 May 2001, 29 July 2002

4.4. Limitations That May Influence Results

4.4.1. General Limitations

The Survey area includes government-owned (BLM, City of Los Angeles) and private land. In 1999 Caltrans sent Notice of Intent to Enter To Conduct Field Survey letters to 127 private property owners requesting permission enter their land to conduct environmetnal surveys. Out of the 127 letters sent, 2 land owners denied survey crews access and 19 land owners did not respond to the letter, therefore it was assumed that access was denied. Biological surveys did not occur in the above mentioned areas.

4.4.2. Wildlife Surveys

Surveys for the desert tortoise were constrained by access to private property.

Surveys for Mohave ground squirrel were done by putting trap grids in what appeared to be the most suitable habitat within the study area. One-hundred percent coverage of the study area was not possible.

5. Results: Environmental Setting

5.1. Description of the Existing Biological and Physical Conditions

The biological study area comprised a large corridor beginning just south of the Los Angeles Aqueduct Bridge No. 48-10 at KP49.5 (PM 30.8) and going north to the Ash Creek Bridge No. 48-11 at KP 67.4 (PM 41.9). The western boundary was the Los Angeles Aqueduct and the high-voltage transmission line located at the north end of the project. The eastern boundary was 61 m (200 ft) from the existing pavement (Figure E-2).

The project area is in a narrow basin east of the steep eastern escarpment of the Sierra Nevada and west of the Inyo and Coso mountains (Figures 1 and 2). North of Olancha it borders the western shore of Owens Lake. Elevation of the existing Hwy. 395 at Olancha is about 1150 m; 9 km (6 mi) west, elevation exceeds 3500 m (11,800 ft). Local streams draining the Sierra Nevada, in particular Olancha and Cartago creeks, flow east, and originally terminated in Owens Lake, as did the Owens River, flowing in from the North. Most of these waters have been diverted into the Los Angeles aqueduct system, but there is still some flow to irrigated pastures west of Hwy. 395.

Land ownership is a mixture of private, especially in and near the communities of Olancha and Cartago, federal, especially Bureao of Land Management, and City of Los Angeles.

6. Results: Biological Resources, Discussion of Impacts and Mitigation

6.1. Federally-Listed or Proposed Animals Species Occurrences

6.1.1. Discussion of Owens tui chub.

6.1.1.1. Survey Results

The Owens tui chub, restricted to the Owens Valley, requires calm, clear streams, spring-fed ponds, or river backwaters with undercut banks or vegetation to provide protection from predators. Three populations of the Owens tui chub are known; the nearest to the current project is at the Cabin Bar Ranch, east of the existing Highway 395 north of Cartago. Because there is no appropriate water within the proposed project area, it does not occur there.

6.1.1.2. Avoidance and Minimization Efforts

Caltrans designed all the alternatives to avoid effects to all wetland habitats. Hydrological changes will be minimized because culverts will be installed where streams cross the highway.

6.1.1.3. Critical Habitat

Critical habitat was designated at the two head springs at the Hot Creek Hatchery east of Mammoth Lakes, and in the Owens River gorge below the Long Valley Dam on Crowley Lake (USFWS 1998), both more than 100 km (60 mi) north of the proposed project.

6.1.1.4. Project Impacts

Caltrans designed all the alternatives to avoid effects to all wetland habitats. Hydrological changes will be minimized because culverts will be installed where streams cross the highway. Thus there will be no effects from this project on the Owens tui chub.

6.1.1.5. Compensatory Mitigation Measures

There are no compensatory mitigation measures proposed.

6.1.1.6. Cumulative Effects (FESA)

Within the past century, numerous factors have affected aquatic habitats in the Owens Valley. These include diversion of water from the Owens River, groundwater drawdown, water impoundments, and livestock grazing, combined with natural drought cycles (USFWS 1996b). These factors led to changes in the plant species composition of wetlands and the decline of numerous plant and animal species. In the study area, small amounts of wetland habitat probably were destroyed during the construction of the existing lanes of Highway

395, building of houses and corrals, and during mining in the area. Hydrology of the wetlands in the study area also could have been affected by previous disturbances upslope, including construction of the railroad, the power lines, and the Los Angeles Aqueduct.

Current and future projects that might affect wetlands in the study area are the ongoing Southern Zones Dust Control Project (CH2MHill 2001) and Western Water Company's proposed groundwater pumping (Bagley and Leatherman 1999). Most of the hydrological changes due to that project will occur far out in the lake bed and the water will come from the existing Los Angeles Aqueduct. Drawdown of the water table as a result of the proposed groundwater pumping could affect moisture availability. However, the wetland vegetation is flood irrigated or supplementally watered with sprinklers or irrigation pipes, so drawdown may not have a great effect.

The Olancha/Cartago four-lane project would not contribute to these cumulative effects because it will avoid direct effects to wetlands and minimize indirect effects.

6.1.2. Discussion of Owens Pupfish

6.1.2.1. Survey Results

The Owens pupfish requires clear, shallow, warm water in sloughs or springs with sand or silt bottoms and a firm substrate for spawning. They were once abundant but have almost disappeared from water diversions and introduction of non-native fishes. The closest of the four known populations is near Bartlett, some 10 km (6 mi) north of the northern boundary of the project area.

6.1.2.2. Avoidance and Minimization Efforts

Caltrans designed all the alternatives to avoid effects to all wetland habitats. Hydrological changes will be minimized because culverts will be installed where streams cross the highway.

6.1.2.3. Critical Habitat

No critical habitat for the Owens pupfish has been designated (USFWS 1998).

6.1.2.4. Avoidance and Minimization Efforts

Because the Owens pupfish does not occur in or near the project location, no avoidance or minimization efforts will be required.

6.1.2.5. Project Impacts

Because the Owens pupfish does not occur in or near the project location, no project effects will occur.

6.1.2.6. Compensatory Mitigation Measures

Because the Owens pupfish does not occur in or near the project location, no compensatory mitigation measures will be required.

6.1.2.7. Cumulative Effects (FESA)

Within the past century, numerous factors have affected aquatic habitats in the Owens Valley. These include diversion of water from the Owens River, groundwater drawdown, water impoundments, introduction of non-native fishes, and livestock grazing, combined with natural drought cycles (USFWS 1996*b*). These factors led to changes in the plant species composition of wetlands and the decline of numerous plant and animal species. In the study area, small amounts of wetland habitat probably were destroyed during the construction of the existing lanes of Highway 395, building of houses and corrals, and during mining in the area. Hydrology of the wetlands in the study area also could have been affected by previous disturbances upslope, including construction of the railroad, the power lines, and the Los Angeles Aqueduct.

Current and future projects that might affect wetlands in the study area are the ongoing Southern Zones Dust Control Project (CH2MHill 2001) and Western Water Company's proposed groundwater pumping (Bagley and Leatherman 1999). Most of the hydrological changes due to that project will occur far out in the lake bed and the water will come from the existing Los Angeles Aqueduct. Drawdown of the water table as a result of the proposed groundwater pumping could affect moisture availability. However, the wetland vegetation is flood irrigated or supplementally watered with sprinklers or irrigation pipes, so drawdown may not have a great effect.

The Olancha/Cartago four-lane project would not contribute to these cumulative effects because it will avoid direct effects to wetlands and minimize indirect effects.

6.1.3. Discussion of Desert tortoise

6.1.3.1. Survey Results

No tortoises or tortoise sign were observed during the survey. Several additional factors support the conclusion that there are no tortoises in the area. The project site occurs at the extreme northern geographic range of the desert tortoise (Stebbins 1985). The elevation, approximately 1158 m (3800 ft), is near the upper limit for tortoises at any latitude (Karl 1983). The dominant plant species in the community suggest that the area experiences colder winters than are typically preferred by desert tortoises. This combination of factors strongly suggests that the project site is outside of the northern limit of tortoises in this region.

In addition to these habitat factors, the high-impact disturbances on the project site would severely reduce tortoise densities if tortoises were present. Several studies (Nicholson 1978, Karl 1989, Boarman 1992, LaRue 1993) strongly support the concept that heavily traveled roads are mortality sinks for tortoises. Highway 395 would probably have nearly eliminated any tortoises in the immediate vicinity of the highway. The LA Aqueduct would also have isolated populations on either side of it. Finally, local residences would have resulted in losses of individual tortoises to dogs, children, vehicles, grading, etc., as well as habitat loss and fragmentation.

The few previous tortoise surveys near the project area have produced no evidence of tortoises in the project vicinity. Surveys conducted by BLM in the late 1970s sampled sites in the project vicinity and to the north but did not report tortoise sign north of approximately Ridgecrest (Berry and Nicholson 1984). Their reporting was limited to estimated densities exceeding 52/sq km (20/sq mi), however. Karl (1984) sampled sites along the LADWP transmission line extending through the Owens Valley and did not observe tortoise sign as far north as the project site. The BLM conducted tortoise surveys for the West Mohave Plan in 1998 and 1999, halting surveys approximately 13 km (8 mi) south of the project; the nearest tortoise sign was observed 16 km (10 mi) south of the project (BLM 1999).

The project site is "uncategorized" by the BLM; the nearest categorized habitat is approximately 29 km (18 mi) south**,** listed as Category 3 (USDI BLM 1988). Category 3 habitat areas are not considered essential to maintenance of viable populations, are thought to have low- to medium-density populations isolated from higher-density populations, and have unresolvable conflicts. Compensation for land disturbed in Category 1 and 2 habitats is based on a formula that includes several variables and cannot exceed 6:1; compensation for Category 3 habitats is always 1:1 (USDI and CDFG 1992).

The site is within the West Mohave Planning Area, but is not specifically designated as a desert tortoise management area (USDI BLM 2000).

Beth Porter, a local resident, reported seeing and photographing an adult desert tortoise along Walker Canyon road just south of Olancha on 28 and 29 February 2001, and provided photographs of it. These photographs were examined by Ms. Denyse Racine, wildlife biologist, CDFG, and Dr. Alice Karl. Adrienne Disbrow, wildlife biologist, CDFG, and Wendy Philpott of Caltrans visited the location on 16 July 2002. Based on the animal's large size and apparent old age, the absence of tortoises or tortoise sign in the area, and knowledge of tortoise habitat requirements, both agreed that the animal was likely an escaped captive tortoise, and that areas north of Highway 395 where the LA Aqueduct crosses are not likely suitable for the desert tortoise.

6.1.3.2. Avoidance and Minimization Efforts

Because there is a chance that an escaped captive tortoise could be within the project area, before any construction activity starts, the contractor shall furnish a qualified biologist, who will be responsible for overseeing compliance with Contract Special Provisions as stated below. The following will be included in the Contract Special Provision for protection of desert tortoisefrom the 190/395 junction south to the end of the project at KP 49.5 (PM 30.8).

The qualified biologist(s) shall be responsible to see that all persons employed on the construction project shall receive instruction regarding the desert tortoise prior to performing on-site work. Instruction shall include the importance of the desert tortoise to the environment, recovery efforts for the desert tortoise, implications of the Endangered Species Act, and the importance of following all terms and conditions provided in the biological opinion. Employees shall be notified that they are not authorized to handle or otherwise move desert tortoises encountered on the project site. An education program that has been previously approved by the USFWS may be used to satisfy this term and condition, provided the project-specific mitigation measures are fully discussed. Only biologists authorized by the USFWS and CDFG shall handle desert tortoises. Caltrans shall submit the names(s) of the proposed authorized biologist(s) to the Service for review and approval at least 15 days prior to the onset of activities. No construction activities shall begin until an authorized biologist is approved.

The authorized desert tortoise biologist shall monitor installation of the temporary fence. Two types of material can be used to construct the temporary fence: 1) Plastic diamond mesh, install a minimum of 18 inches above ground and fold the bottom of the mesh toward the habitat side of the barrier and away from the highway then backfill: 2) Install temporary linear sediment barrier (Type silt fence), minimum 18 inches above ground and bury material minimum 6 inches below ground.

After installation, the qualified biologist(s) shall conduct 100% coverage clearance surveys and regularly inspect the fence to ensure its integrity. Any repairs to the fence shall be made immediately.

The entire project area shall be surveyed for desert tortoises by the authorized biologist after installation of the fence and within seven days prior to the start of any further construction activities. Desert tortoise burrows within the project limits shall be excavated by hand either by or under the direct supervision of the authorized biologist, and collapsed to prevent reentry. All desert tortoises found shall be removed from within the fenced area or placed outside of the construction corridor. If the removal is during the season of above-ground activity, the desert tortoises shall be placed beside a nearby burrow of appropriate size. If the removal is not in the season of above-ground activity, the desert tortoise shall be moved (dug out of burrow, if necessary) on a seasonably warm day and placed at the mouth of a nearby burrow of appropriate size. If the desert tortoise does not enter the burrow, an artificial burrow may be constructed and the desert tortoise placed within it. The authorized biologist shall be allowed some judgment and discretion to ensure that survival of the desert tortoise is likely.

If desert tortoises are encountered above ground during construction, the desert tortoise shall be moved out of the construction corridor, placed under a shrub in the direction it was traveling. In general, desert tortoises should be moved the minimum distance possible to ensure their safety. If desert tortoises need to be moved at a time of the day when ambient temperatures could harm them (i.e. extremely low [less than 40^{o}F] or high [greater than 90^{o}F] temperatures), they shall be held overnight in a clean cardboard box. These desert tortoises shall be kept in the care of the authorized biologist under appropriate controlled temperatures and released the next day when temperatures are favorable. All cardboard boxes shall be properly discarded after one use.

Desert tortoises moved from within fenced sites shall be marked for future identification. An identification number using the acrylic paint/epoxy covering technique shall be placed on the fourth left costar scute (Fish and Wildlife Service 1990). 35-mm slide photographs of the carapace, plastron, and the fourth costar scute shall be taken. No notching is authorized.

Desert tortoises shall be handled only by the authorized biologist and only when necessary. New latex gloves shall be used when handling each desert tortoise to avoid the transfer of infectious diseases between animals.

The authorized biologist(s) shall follow the General handling Protocol sections of the "Protocols for Handling Live tortoises" (Arizona Game and Fish Department et al. 1991).

There will not be any replacement of lost fluids in any desert tortoise with a syringe.

If it is necessary for a worker to park temporarily outside of the fenced enclosures, the worker shall inspect for desert tortoises under the vehicle prior to moving it. If a desert tortoise is present, the worker shall carefully move the vehicle only when necessary and when the desert tortoise would not be injured by moving the vehicle or shall wait for the desert tortoise to move out from under the vehicle. The authorized biologist may also be contacted to remove the desert tortoise.

The authorized biologist shall maintain a record of all desert tortoises handled. This information shall include for each desert tortoise:

1. The locations (narrative and maps) and dates of observations,
2. General condition and health, including signs of diseases, injuries and state healing, and whether animals voided their bladders,
3. Location moved from and location moved to,
4. Diagnostic markings (e.g., identification numbers or marked lateral scutes), and
5. Slide photograph of each handled desert tortoise as described in term and condition 3.

No later than 90 days after the completion of construction or termination of exploration activities, authorized biologist(s) shall prepare a report for Caltrans, which will be forwarded to the USFWS and CDFG. The report shall document the effectiveness and practicality of the mitigation measures, the number of desert tortoises excavated from burrows, the number of desert tortoises moved from the site, the number of desert tortoises killed or injured, and the specific information for each desert tortoise as described in measure 1 and 2 above The report shall make recommendations for modifying the stipulations to enhance desert tortoise protection or to make it more workable for the contractor. Upon locating dead or injured desert tortoises, initial notification must be made within three working days of the finding first to the Engineer, then to the USFWS Division of Law Enforcement in Torrance at (310) 297-0062. The USFWS Ventura field Office shall also be notified at (805) 644-1766. Written notification to both offices must be made within five calendar days and include the date, time, and location of the carcass, a photograph, and any other pertinent information. Care must be taken in handling sick or injured animals to ensure effective treatment and in handling dead specimens to preserve biological material in the best possible state. Caltrans shall endeavor to place the remains of intact desert tortoises with educational or research institutions holding the appropriate State and Federal permit per their instructions. If such institutions are not available or the shell has been damaged, the information noted above shall be obtained and the carcass left in place. Caltrans should consider marking the carcass in a manner that would not be toxic to other wildlife to ensure that it would not be re-recorded in the future.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution by Caltrans through a biologist prior to implementation of the action. Injured animals shall be transported to a qualified veterinarian. Should any treated desert tortoises survive, the USFWS shall be contacted regarding the final disposition of the animals.

The Contractor shall also conform to the following requirements and shall conduct his work accordingly.

- Wrappers, food scraps, cans, bottles, etc. must be disposed of in a closed trash container or removed from the site.
- Do not travel or place materials or equipment outside the designated construction areas.
- Report any tortoise sighted to the Engineer. Sightings must be quickly reported and any work that may harm the tortoise shall be stopped until it is removed by the approved biologist.
- Do not touch, harass, collect, or otherwise harm tortoises.
- If, during construction, the contractor discovers a desert tortoise, the Contractor shall protect it and immediately notify the Engineer. Work shall be stopped in the immediate area until the approved biologist can move the tortoise safely.
- If, during construction a Desert Tortoise is harmed or killed, the Contractor shall immediately notify the Engineer. Work shall be stopped in the immediate area until the approved biologist can remove the injured or dead tortoise.
- Full compensation for conforming to the requirements of this section, including furnishing the biologist, shall be considered as included in the contract prices paid for the various work and no additional compensation will be allowed.

6.1.3.3. Critical habitat

The USFWS designated critical habitat for the desert tortoise in 1994 (59 FR 5820 5866). The closest desert tortoise critical habitat to the proposed project is more than 100 km (60 mi) to the south.

6.1.3.4. Project Impacts

No direct effects are expected to occur from any alternative because the Contract Special Provisions will eliminate the chance that an escaped captive tortoise will be harmed.. The habitat is not suitable for desert tortoies and the likley hood of its occuring is very very small.

6.1.3.5. Compensatory Mitigation

Because the Mohave ground squirrel and desert tortoise occupy similar habitat, compensatory mitigation proposed for MGS (3:1 ratio) will also cover the desert tortoise.

6.1.3.6. Cumulative Effects

Because the project area is outside the natural range of the desert tortoise, the project will not contribute to cumulative effects on desert tortoises or their habitat.

6.1.4. Discussion of Least Bell's vireo

6.1.4.1. Survey Results

Least Bell's vireo is a small songbird that was once widespread in low-elevation riparian areas of the state. Its preferred habitat is willow riparian woodland. It is present in California only during the breeding season. The loss of riparian habitat and nest parasitism by the brown-headed cowbird (*Molothrus ater*) have drastically reduced the numbers and range of least Bell's vireo. Bell's vireo has historically nested in the Olancha area, but it is unclear if it was the Least Bell's vireo subspecies (Bagley and Leatherman 1999). There is no riparian willow habitat in the project area, therefore it is extremely unlikely that the least Bell's vireo is present.

6.1.4.2. Avoidance and Minimization Efforts

Because the least Bell's vireo does not occur in or near the project location, no avoidance or minimization efforts will be required.

6.1.4.3. Critical habitat

Critical habitat for the least Bell's vireo was designated by the USFWS in 1994 (59 *FR* 4845) and includes reaches of ten streams in southern California from Santa Barbara County to San Diego County encompassing approximately 38,000 ac.

6.1.4.4. Project Impacts

Because the least Bell's vireo does not occur in or near the project location, no project effects will occur.

6.1.4.5. Compensatory Mitigation Measures

Because the least Bell's vireo does not occur in or near the project location, no compensatory mitigation measures will be required.

6.1.5. Discussion of Swainson's Hawk

6.1.5.1. Survey Results

Swainson's hawks breed in the Central Valley and Owens Valley, often nesting in trees adjacent to agricultural fields or pastures. They forage over open shrublands, alfalfa fields, and pastures. They are present in California only for nesting, and they winter in South America. No Swainson's hawks were observed during the focused surveys or during any other fieldwork on this project. Stick nest sites were frequently observed, but no Swainson's hawks were seen on or near them.

In correspondence dated 17 May 2001 to R. Schlorff of CDFG, Karyn Sernka, who has conducted surveys for Swainson's hawks in the area for several years, reported seeing no Swainson's hawks in a historically occupied territory at the southeastern part of the study area off Cactus Flat Road in May of 2001. She related that the last time the territory was occupied was in 1999, when the nest failed. This may be the same nest reported in Bagley and Leatherman (1999). In a draft report, Sernka (no date) presented results of a Swainson's hawk survey in the Owens Valley in 1998 in which no Swainson's hawk nests were found south of Big Pine, some 40 miles north of the study area.

In an email to T. Kucera dated 29 July 2002, Ms. Sernka reported that in the spring of 2002 there was a nesting pair of Swainson's hawks "…off Cactus Flat Road in one of the windbreak trees on the west side of an alfalfa field**.** An active Swainson's hawk nest was not found in Olancha in 2001….I believe it was 2000 (and/or 1999?) when a pair of Swainson's hawks were nesting in Olancha off Cactus Flat road in a locust tree in the windbreak on the south side of the alfalfa field. We were unsuccessful trapping/banding the adults that year due to high winds. This year we were able to band one adult at the Olancha nest." This nest is approximately one km (0.6 mi) east of the southern end of the project area. Swainson's hawks, then, appear to nest sporadically in the vicinity of the project area.

6.1.5.2. Avoidance and Minimization Efforts

Alternatives were designed where possible to avoid removal of trees. Only Alternative 1 includes removing trees.

6.1.5.3. Project Impacts

There is no evidence suggesting that any trees that might be removed have been used for nesting by Swainson's hawks, so the project is unlikely to have any effect on them.

6.1.5.4. Compensatory Mitigation

Any trees removed will be replaced at a 2:1 ratio. Plantings will occur as close to the project area as possible.

6.1.5.5. Cumulative Effects

Because there will be no effects to Swainson's hawks, there will be no cumulative effect to them from this project.

6.1.6. Discussion of the Mohave ground squirrel

6.1.6.1. Survey Results

In 2001, we captured no Mohave ground squirrels (Tables E-3, E-4). During the first trapping session in 2002, we captured Mohave ground squirrels on grids 1, 2, 13 and 14 (Table E-5, Figure E-4). During the second trapping session in 2002, we trapped at all 10 of the original grids and again captured Mohave ground squirrels on grids 1 and 2 (Table E-6). No Mohave ground squirrels were captured on any of the other 8 original grids. We thus conclude that Mohave ground squirrels are present on the southern portion of the study area.

Table E-3. Results of live-trap ground squirrel survey in the Olancha project area,Inyo County, during Session 1, April 2-12, 2001.

Grid Number	White-tailed Antelope Squirrel		Mohave Ground Squirrel	
	Individuals	Captures	Individuals	Captures
1	7	8	0	0
2	6	9	0	0
3	8	12	0	0
4	4	6	0	0
5	0	0	0	0
6	0	0	0	0
7	1	1	0	0
8	0	0	0	0
9	1	1	0	0
10	0	0	0	0
Totals	27	37	0	0

Table E-4. Results of live-trap ground squirrel survey in the Olancha project area, Inyo County, during Session 2, May 6-16, 2001.

Grid Number	White-tailed Antelope Squirrel		Mohave Ground Squirrel	
	Individuals	Captures	Individuals	Captures
1	1	1	0	0
2	4	4	0	0
3	8	9	0	0
4	1	1	0	0
5	1	1	0	0
6	2	2	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
Totals	17	18	0	0

Table E-5. Results of live-trap ground squirrel survey in the Olancha project area, Inyo County, during Session 1, 26 March-5 April 2002.

Grid Number	White-tailed Antelope Squirrel		Mohave Ground Squirrel	
	Individuals	Captures	Individuals	Captures
1	20	63	6 (4m, 2f)	17
2	26	109	4 (1m, 3f)	11
13	10	19	4 (2m, 2f)	7
14	7	22	3 (1m, 2f)	7
15	17	50	0	0
3	19	74	0	0
4	11	31	0	0
6	8	30	0	0
7	20	70	0	0
10	1	1	0	0
Totals	139	469	17 (8m, 9f)	42

Table E-6. Results of live-trap ground squirrel survey in the Olancha project area, Inyo County, during Session 2, 6-16 May 2002.

Grid Number	White-tailed Antelope Squirrel		Mohave Ground Squirrel	
	Individuals	Captures	Individuals	Captures
1	29	83	3 (3 m, 0f)	15
2	33	137	3 (0m, 3f)	10
3	22	88	0	0
4	41	81	0	0
6	15	53	0	0
5	13	39	0	0
7	20	41	0	0
8	9	36	0	0
9	9	34	0	0
10	0	0	0	0
Totals	191	592	6 (3m, 3f)	25

6.1.6.2. Avoidance and Minimization Efforts

None are planned.

6.1.6.3. Project Impacts

Based on our trapping results, we assume that the southern end of Grid 3 is the northern boundary of the distribution of Mohave ground squirrels on the project area Thus, the proposed alignments (from right-of-way fence to right-of-way fence) will remove the following amounts of Mohave ground squirrel habitat:

Alernative 1. 20.6 ha (50.8 ac)

Alternatives 2 and 2a. 34.1 ha (84.3 ac)

Alternatives 3 and 3a. 24.8 ha (61.2 ac).

6.1.6.4. Compensatory Mitigation

Based on informal consultation with CDFG, Bishop Office,compensatory mitigation for the loss of Mohave ground squirrel habitat will be at a ratio of 3:1.

6.1.6.5. Cumulative Effects

There are no other known projects in the study area that are likely to affect the Mohave ground squirrel.

7. Conclusions and Determination

7.1. Conclusions

The Owens tui chub, Owens pupfish, desert tortoise, and least Bell's vireo do not occur in the study area and thus will not be affected by the proposed project. No aquatic habitat exists to support fish, and project alternatives were designed to avoid effects to hydrology and wetlands. The project is probably north of the native range of the desert tortoise; the one adult desert tortoise documented in the project area was liekly an escaped captive. Swainson's hawk occasionally nests in trees within one km (0.6 mi) of the project; if the one alternative that involves tree removal is selected, replacement trees will be planted as close as possible in a 2:1 ratio. Mohave ground squirrels do occur in the project area. Loss of Mojave ground squirrel habitat, which varies from 20.6 ha (50.8 ac) to 34.1 ha (84.3 ac) by alternative will be mitigated at a 3:1 ratio.

7.2. Determination

A determination of "No effect" was made for the Owens tui chub, Owens pupfish, desert tortoise, and least Bell's vireo (Table E-7). There are no aquatic areas on the project that will be affected and that could therefore affect the fish, the project area is outside the natural range of the desert tortoise, and there is no habitat for least Bell's vireo. The determination of "Not likely to trend towards federal listing" for the Swainson's hawk was based on the fact that Swainson's hawk does not nest in the project area, but one nest site nearby is known to be used sporadically. This nest site and adjacent agricultural fields over which the birds likely forage will not be affected by the project. The mature cottonwood and locust trees that would be removed in Alternative 1 that could potentially be used as nest trees by Swainson's hawks will be replaced at a 2:1 ratio if that alternative is selected. The determination of "Not likely to trend towards Federal listing" for the Mohave ground squirrel is based on the fact that any loss of habitat, which varies by alternative from 20.6 ha (50.8 ac) to 34.1 ha (84.3 ac) will be mitigated at 3:1 ratio.

Table E-7. Determination of effects.*

Species or habitat	Alternative 1	Alternative 2	Alternative 2a	Alternative 3	Alternative 3a
Federally-listed or proposed species					
Desert tortoise	No effect	No effect	No effect	No effect	No effect
Owen's tui chub	No effect	No effect	No effect	No effect	No effect
Least Bell's vireo	No effect	No effect	No effect	No effect	No effect
Owen's pupfish	No effect	No effect	No effect	No effect	No effect
Swainson's hawk	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing
Mohave ground squirrel	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing	Not likely to trend towards Federal listing

8. References

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Personal Communications

Bradbury, M. 29 February 2000. Swainson's hawk surveys. mbradbur@cd-eso.water.ca.gov. Email to D. Newman of ESRP outlining survey procedures for Swainson's hawks.

Noda, Diane K. 18 June 2002. Species list for a proposed project on Highway 395 between Post Mile 30 and 42, Inyo County, California. USFWS. 2pp.

Sernka, K. 17 May 2001. Owen's Valley Swainson's hawks. Western Ecological Services. kserenka@west-inc.com. Email to R. Schlorff of CDFG discussing results of surveys for Swainson's hawks in the Olancha/Cartago area, and history of nesting attempts in the vicinity.

Sernka, K. 29 July 2002. Owen's Valley Swainson's hawks. Western Ecological Services. kserenka@west-inc.com. Email to T. Kucera discussing Swainson's hawk surveys in 2001 and earlier years.

Walker, G. 20 March 2001. Desert tortoise protocol. USFWS. George_Walker@fws.gov. Gave authorization to conduct desert tortoise surveys.

Appendix A. Project Alternatives

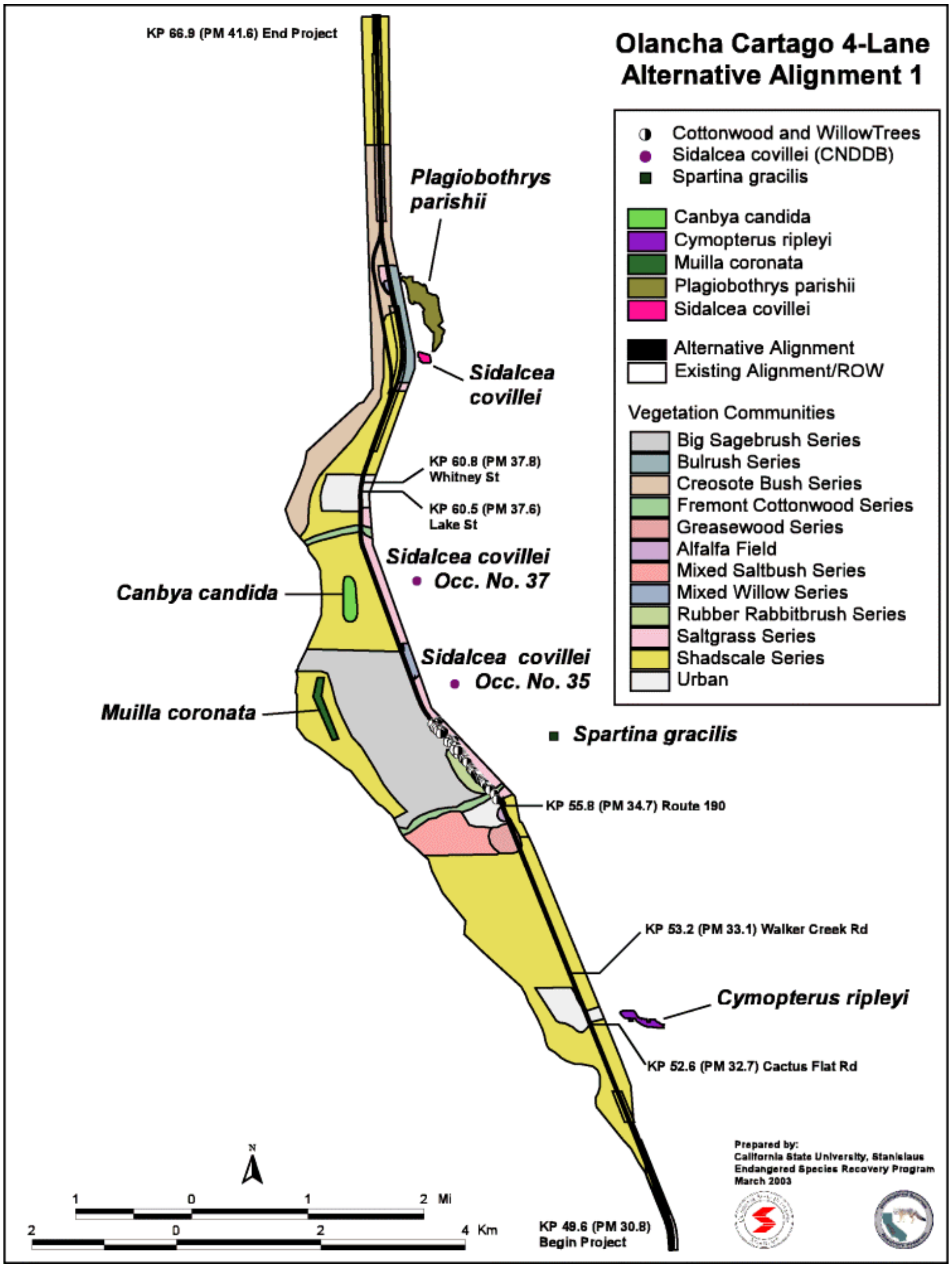

Figure A-1. Alternative alignment 1.

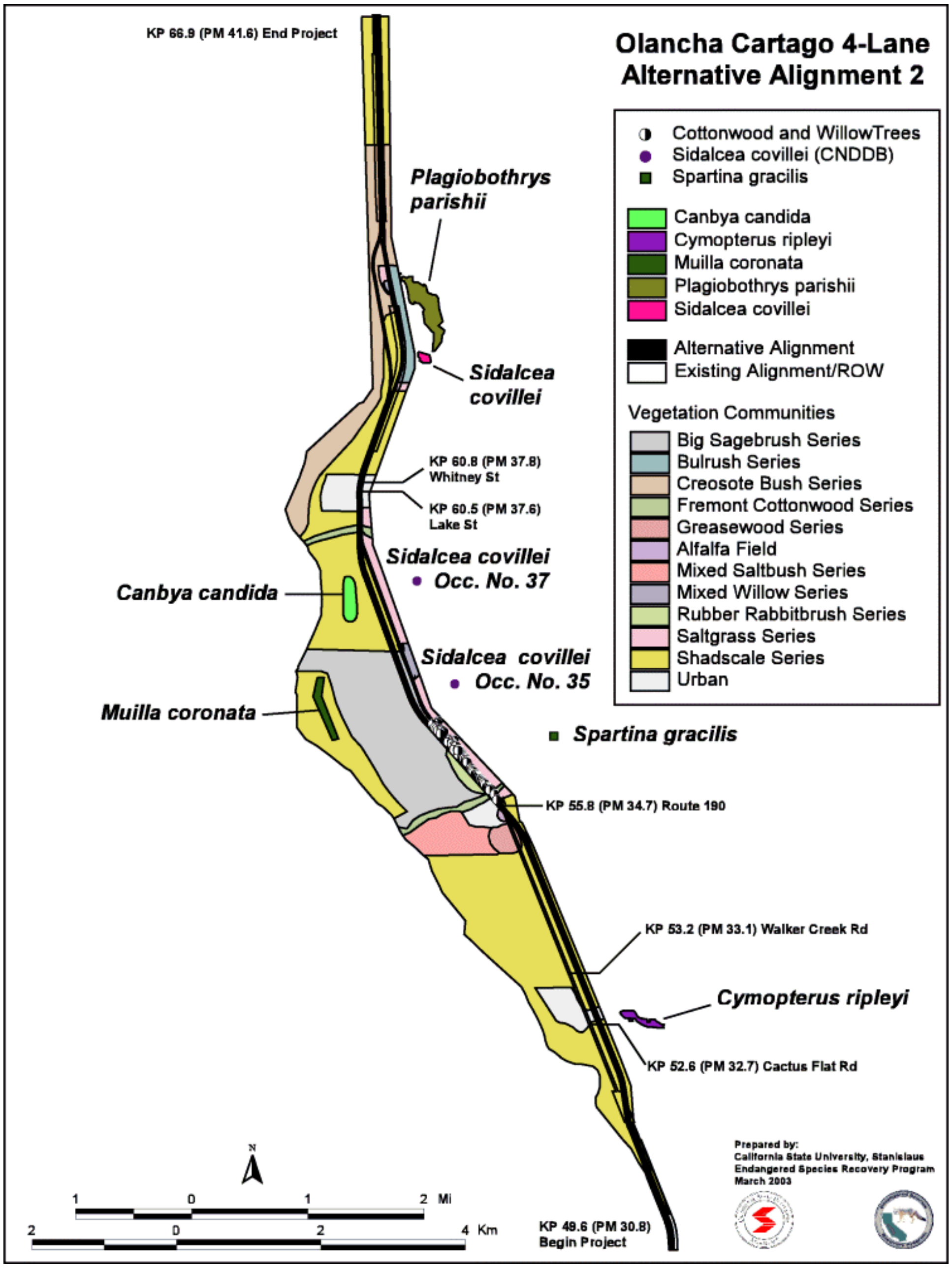

Figure A-2. Alternative alignment 2.

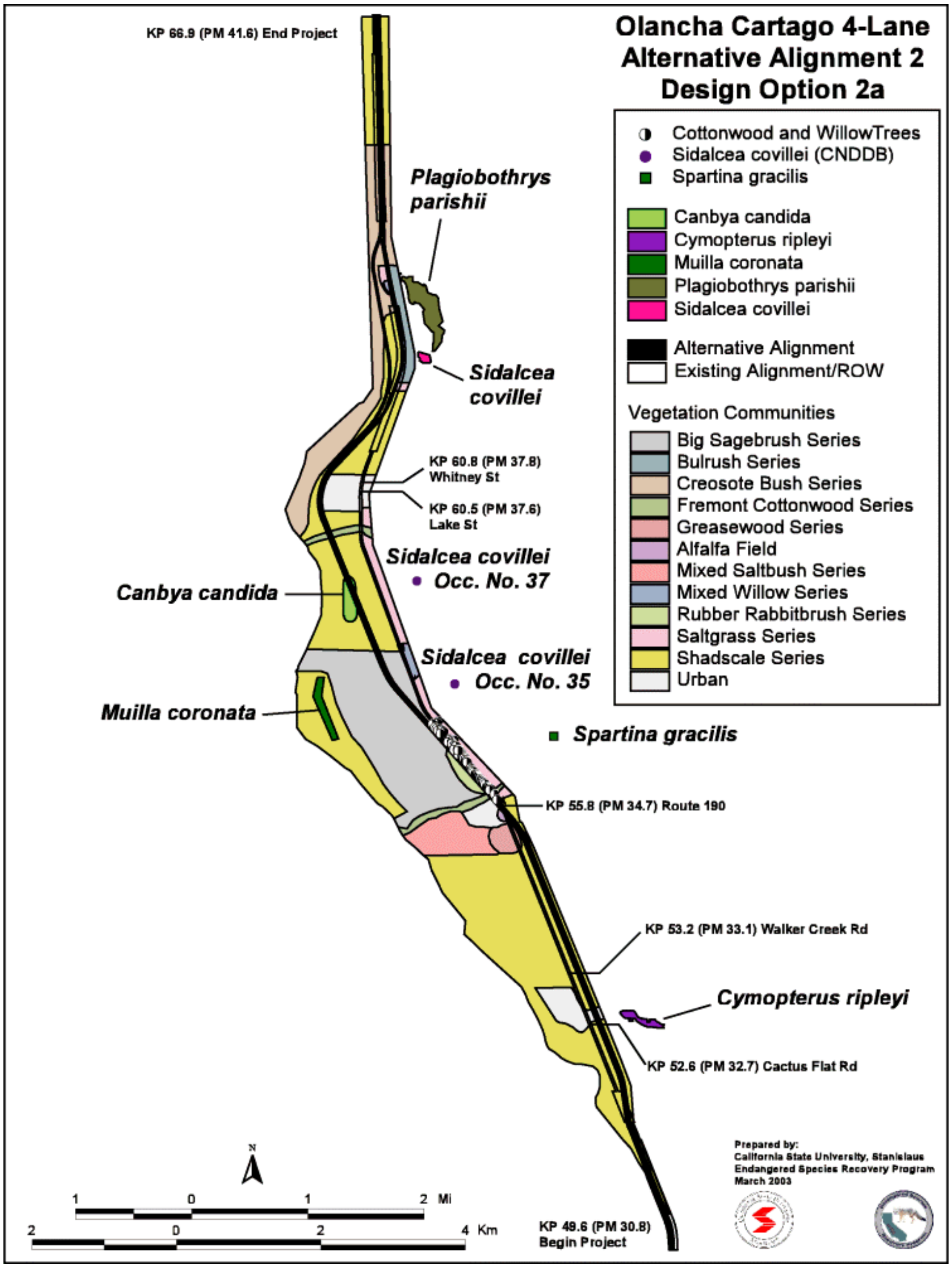

Figure A-3. Alternative alignment 2, design option 2a.

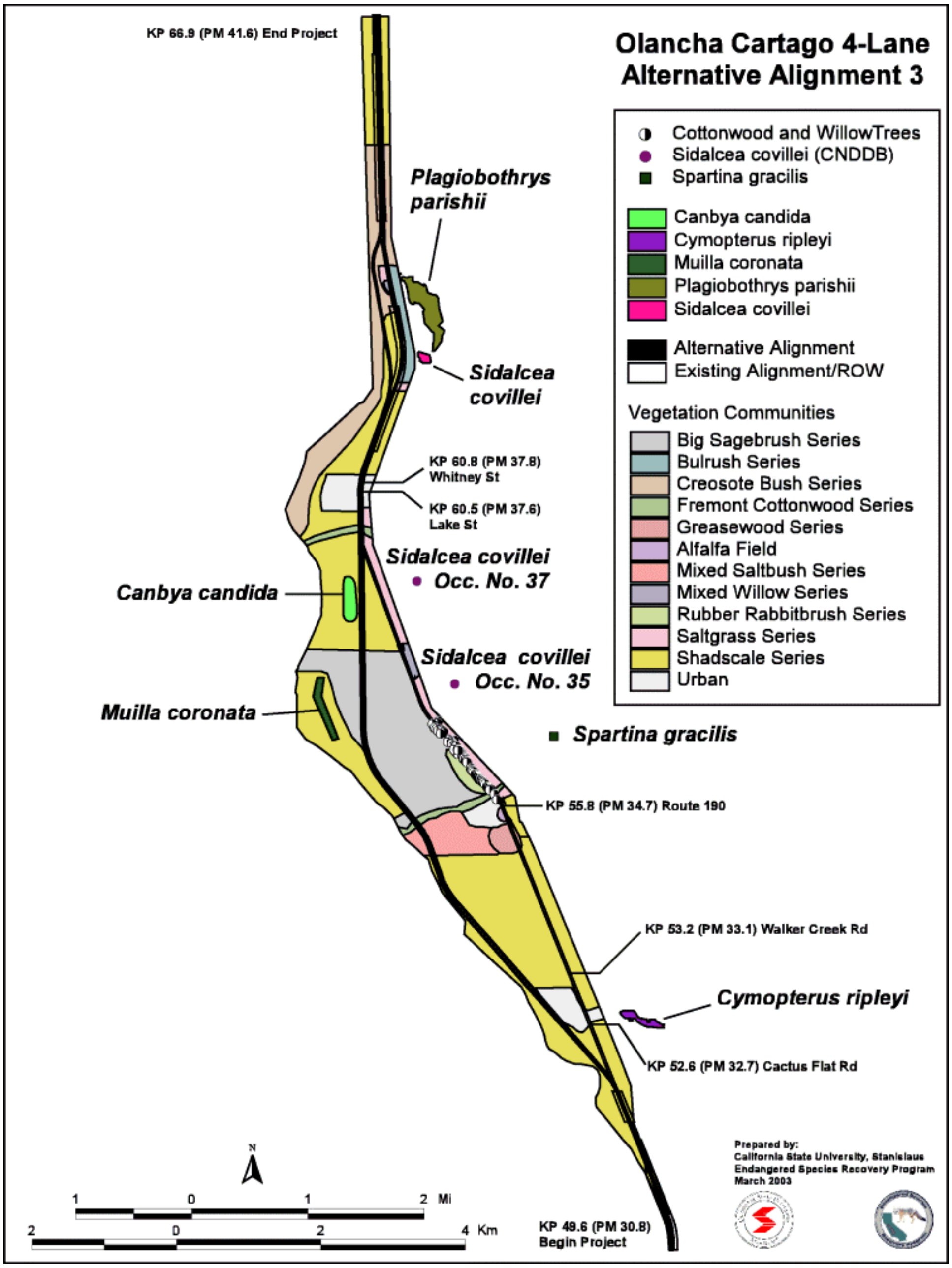

Figure A-4. Alternative alignment 3.

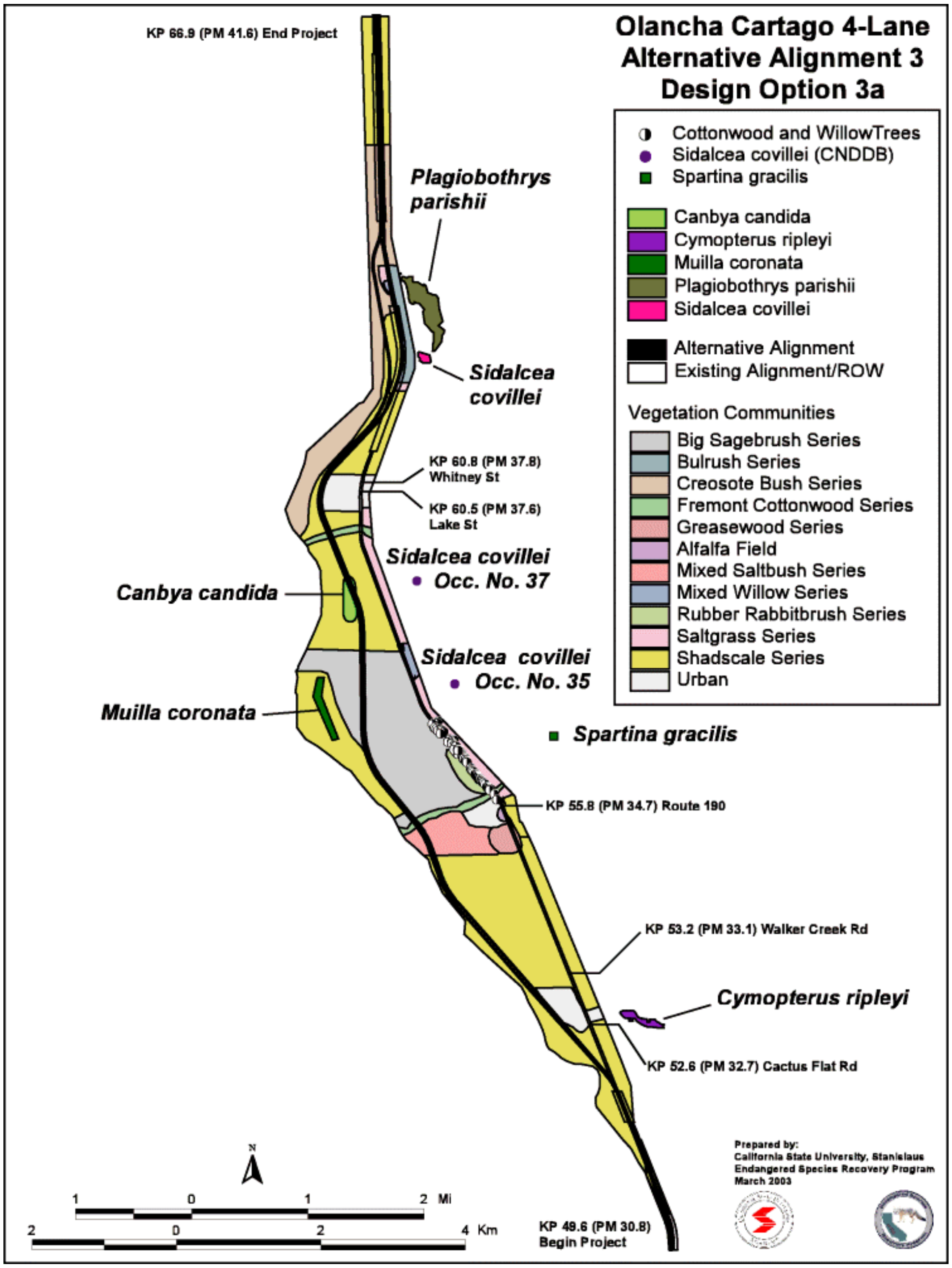

Figure A-5. Alternative alignment 3, design option 3a.

Appendix F. Agency Consultation and Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

In Reply, refer to: 2002-7SP-403.1

June 18, 2002

Wendy Philpott
District 9
Department of Transportation
500 South Main Street
Bishop, California 93514-3423

Subject: Species List for a Proposed Project on Highway 395 between Post Mile 30 and 42, Inyo County, California

Dear Ms. Philpott:

This letter is in response to your request, dated January 30, 2002, for information on threatened and endangered species which may be present on or near the proposed project on Highway 395 between Post Mile 30 and 42, Inyo County, California. The federally endangered least Bell's vireo (*Vireo bellii pusillus*), Owen's tui chub (*Gila bicolor snyderi*), and the Owen's pupfish (*Cyprinodon radiosus*) are the only federally listed species known to occur in this area. The only record for the least Bell's vireo is from the 1891 Death Valley expedition, noted in the California Natural Diversity Data Base occurrence data for Owen's Valley. This response fulfills the requirements of the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act of 1973, as amended (Act).

The Federal Highway Administration (FHWA), as the lead federal agency for the proposed action, has the responsibility to review its proposed activities and determine whether any listed species may be affected. If the proposed action requires the preparation of an environmental impact statement, the FHWA has the responsibility to prepare a biological assessment to make a determination of the effects of the action on the listed species. If the FHWA determines that a listed species is likely to be adversely affected, it should request, in writing through our office, formal consultation pursuant to section 7 of the Act. Informal consultation may be used to exchange information and resolve conflicts with respect to threatened or endangered species prior to a written request for formal consultation. During this review process, the FHWA may engage in planning efforts but may not make any irreversible commitment of resources. Such a commitment could constitute a violation of section 7(d) of the Act.

Wendy Philpott 2

Only listed species receive protection under the Act. However, other sensitive species should be considered in the planning process in the event they become listed or proposed for the listing prior to project completion. We recommend that you review information in the California Department of Fish and Game's Natural Diversity Data Base and that you contact the CDFG at (916) 324-3812 for information on other species of concern that may occur in this area.

If you have any questions, please contact Tim Thomas of my staff at (760) 255-8890.

Sincerely,

for Diane K. Noda
Field Supervisor

MSN Hotmail -MSN - More Useful Everyday   Hotmail®

tom_kucera@hotmail.com Inbox | Previous Page

From: Wendy_Philpott@dot.ca.gov

To: tom_kucera@hotmail.com

Subject: CDFG Field Review

Date: Thu, 18 Jul 2002 06:43:38 -0700

I met with Adrienne Disbrow the F & G Environmental Scientist assigned to the Olancha/Cartago project on Tuesday July 16, 2002. The topics of discussion where:

1) The ratio of mitigation for the MGS will be 3:1, but for only the habitat that falls south of Grid 2.

2) A recorded nest location for the Swainson's hawk exists just to the east of the project by the alfalfa fields. I forget the name of the road, but I will ask Adrienne again. So she is going to check with her supervisor on weather the cottonwood trees within the project area will be considered habitat and if so then at what ratio will replacement need to take place.

3) As for the tortoise sighting, she agreed with me that it is most likely an escapee and that F & G does not consider habitat north of the aqueduct suitable for the tortoise, so this is what we worked out as mitigation

1) education program for the construction workers,

2) 100% clearance surveys before any ground disturbing activities start,

3) if the tortoise is located then F & G will be contacted and the animal will be removed from the sight. I have standard special provisions that will take care of these requirements, I just need to work on them and adjust them to this project, so give me 2 or 3 weeks to do that.
On another note, I will be sending Laurie Williams the CD with all 5 alternatives on it. What we need to do is analyse all 5 alternatives, but then when the preferred alternative is picked then we can send the document to the Service and CDFG.

On yet another note, let me know when you put the camera in the mail, that way I can watch for it. Thanks for the good work. Wendy

Wendy PhilpottAssociate Biologist
500 South Main Street
Bishop CA 93514
Phone: (760) 872-2331
Fax: (760) 872-8402

From: "Denyse Racine" <Dracine@dfg.ca.gov>

To: <tom_kucera@hotmail.com>

Subject: Re: Mohave ground squirrels

Date: Fri, 08 Feb 2002 12:33:06 -0800

Hi Tom,

Yes, DW and I agree that your plan is a good one. For some reason I thought you were going to the MGS TAG meeting yesterday and DW would have a chance to talk to you about it, but he ended up sick and it doesn't sound like you were planning to go anyway. I will be gone for the next two weeks but DW is up to speed on the issue if you want to talk to him some more about it. Talk to you later,

Denyse

>>> "Tom Kucera" <tom_kucera@hotmail.com> 02/05/02 05:14PM >>>

Denyse,

Have you had a chance to pursue the MGS trapping plan for the Olancha/Cartago 395 project that we discussed recently? You were going to discuss it with Darrel and figure how to tweak the bureaucracy to do something that makes sense. I'll be over there looking at potential trapping locations with Phil Leitner and Pat Kelly on Friday. Thanks.

Tom

____

Thomas E. Kucera, Ph.D.

22 Reservoir Road

San Rafael CA 94901

415-482-9325

From: Karyn Sernka <ksernka

To: tom_kucera@hotmail.com

CC: dracine@dfg.ca.gov

Subject: Olancha Swainson's

Date: Mon, 29 Jul 2002 15:16:59 -0600

Hi Tom ~

I was forwarded an e-mail that didn't have a specific question - just a general discussion of a Swainson's hawk sighted around HWY 395 in Olancha. I have been monitoring the Swainson's hawk population in the Owens Valley since 1998. I have been working with Pete Bloom and Dick Anderson trapping and banding both adults and young Swainson's hawks since 1999. Denyse Racine is the Fish and Game district biologist in the area and has participated in the Swainson's hawk research as well. This year there was a pair nesting in Olancha off Cactus Flat road in one of the windbreak trees on the west side of an alfalfa field. An active Swainson's hawk nest was not found in Olancha in 2001. I would have to double-check my records, but I believe it was 2000 (and/or 1999?) when a pair of Swainson's hawks were nesting in Olancha off Cactus flat road in a locust tree in the windbreak on the south side of the alfalfa field. We were unsuccessful trapping/banding the adults that year due to high winds. This year we were able to band one adult at the Olancha nest.

I hope this information is helpful to you. If you have any questions please feel free to write or call me at (307) 634-1756 day or (307) 630-3310 cell.

Karyn Sernka

Wildlife Biologist

From: Karyn Sernka <ksernka@west-inc.com>
To : "Ron Schlorff" <RSchlorf@dfg.ca.gov>

CC: Dracine.PO REG6.DOM REG6@dfg.ca.gov, kucera@esrp.org

Subject: Re: Owen's Valley Swainson's

Date: Thu, 17 May 2001 09:51:40 -0600

Hi Ron ~

The Owens Valley was a quick trip - just got back to Wyoming. I still need to type in my notes and retrieve the updated report from my home computer. The Olancha territory was not occupied this year. The area that has been occupied in the past, and where Tom Kucera may want to take a second look (I only made one pass through this year at 8:30 AM on May 11th) is off Cactus Flat Road. Cactus Flat Road runs east of HWY 395 across from the fire station on the south end of Olancha. There are alfalfa fields surrounded by trees. The historic nest site is at the south end of the southernmost alfalfa field along Cactus Flat Road. I believe the last time this nest was occupied was in 1999 when the nest failed. The southernmost Swainson's hawk nest that I located was in Big Pine, although in the past I have seen Swainson's hawks foraging in Independence, either Black Rock or Fish Springs and at the 8 mile ranch. Hope this helps for now.

How are you? Hope your truck is back on the road. Talk with you soon. Cheers!!

Karyn

At 11:07 AM 5/16/01 -0700, you wrote:

Karyn

Got your E-mail from John. How'd things go in Owen's Valley? Got any news for me? Tom Kucera is especially interested in the Olancha area. Please send me what you have and the latest version of your report, if you have it. Thanks.

Ron

From: "Alice E. Karl" <heliophile@mindspring.com>
To: "Tom Kucera" <tom_kucera@hotmail.com

Subject: Fw: Olancha des. tort. project

Date: Thu, 22 Mar 2001 14:10:55 -0800

Tom,

Here's approval from G. Walker.

I have surveys TENTATIVELY planned for the week of June 18, for 5-6 days. I will need three of your junior people (untrained is great) for this. I have 4-5 experienced people (including me) committed. I'll review the costs again, more closely. Can I assume you also want a report?

Best, Alice

Alice E. Karl, Ph.D.

P.O. Box 74006

Davis, CA 95617

(530) 666-9567

----- Original Message -----

From: <George_Walker@r1.fws.gov>

To: Alice E. Karl <heliophile@mindspring.com>

Sent: Tuesday, March 20, 2001 1:33 PM

Subject: Re: Olancha des. tort. project

> Hi Alice,

> As regards our conversation, we do accept desert tortoise surveys outside the normal survey season (April - June), but recognize sighting of live tortoises is somewhat diminished due to extreme temperatures. Therefore, it is incumbent that the surveyors are well versed in recognition of tortoise "sign" such as burrows, scat, bone/shell fragments, and the more subtle signs including courtship rings and drinking bowls. Before accepting a tortoise survey, we review it for protocol or methodology (we highly recommend that the FWS protocol be used). If the FWS recommended survey protocol is deviated from, the reasons for such departures should be fully explained in the body of the survey report. We also review the surveyor's or principle investigator's qualifications to ascertain their abilities to conduct a bono-fide survey. All surveyors, who are not qualified to conduct desert tortoise surveys, should be under the direct supervision of a qualified biologist.

>

> I hope this helps. Call me if you have any questions.

> George

>

> ***

> George Walker

> Chief, Mojave and Great Basin Deserts Division

> U.S. Fish and Wildlife Service

> 222 East Main Street, Suite 202

> Barstow, California 92311

> Phone: (760) 255-8852

> Fax: (760) 255-8897

> Email: George_Walker@fws.gov

> **

>> "Alice E. Karl"

> <heliophile@mindspring.com>

To: george walker@fws.gov

cc: "Tom Kucera" tom kucera@hotmail.com

Subject: Olancha des. tort. project

> 03/14/2001 03:33 PM>

>> Hi George,

>> Relative to our conversation today, I wanted your written approval for Cal Trans' files that conducting desert tortoise surveys in the summer - when sign will have accumulated and tortoises will be best detected - will be an approved approach for censusing desert tortoises for Cal Trans' Highway 395 relocation/widening project south of Olancha, Inyo County. Thanks. See you at the Council meeting.

Alice E. Karl, Ph.D.

P.O. Box 74006

Davis, CA 95617

(530) 666-9567

From: Wendy_Philpott@dot.ca.gov

To: "Tom Kucera" <tom_kucera@hotmail.com>

Subject: Re: Olancha Cartago

Date: Mon, 22 Oct 2001 08:46:45 -0700

10/22/01 @ 0835

Talked with George Walker about conducting informal consultation with the Service on the desert tortoise. George said that because the Service is so backed up with a heavy work load that they will not be able to conduct an informal review of our document justifying not mitigating for the desert tortoise. What he did say is that from what I told him about the project and the general area, habitat, the barrier issue, that it may be more appropriate to determine a no effect then go to the Service for concurrence. The BA would determine no effect and include the justification for that determination. So I guess what we will do is just write the BA as planned and not a separate justification document.

Wendy

Natural Environment Study

(Addendum to the original June 2003 NES)

Olancha/Cartago Four-lane Project
Inyo County, California

09-INYO-395- PM 29.2/41.8

09-21340

April 2010

Natural Environment Study

(Addendum to the original June 2003 NES)

Olancha/Cartago Four-lane Project
Inyo County, California

09-INYO-395-PM 29.2/41.8

09-21340

April 2010

STATE OF CALIFORNIA
Department of Transportation

Prepared By: Frank Meraz Date: 4-30-10
Frank Meraz, Environmental Planner (N/S)
(559) 243-8294
Central Region Biology Branch
District 6-Central Region

Approved By: Virginia Strohl Date: 4/30/10
Virginia Strohl, Acting Biology Branch Chief
(559) 243-8196
Central Region Biology Branch
District 6-Central Region

Summary

The California Department of Transportation (Caltrans) and Federal Highway Administration (FHWA) propose to construct a four-lane expressway along a portion of Highway 395 in Inyo County. In the 2003 NES that describes impacts to several alternatives, the "no build" alternative was identified as "alternative 4". A new alternative that shifts the alignment to the west of exisiting HWY 395 is now identified as "alternative 4" in the 2010 NES. This document describes impacts for the new Alternative 4.This NES also briefly mentions a design option (Alternative 2R) that was dropped from consideration. A Botanical Survey Report (Appendix A) and Jurisdictional Wetland Delineation Report (Appendix B) were also conducted as part of the new alternatives.

Project Description

The proposed project will upgrade the existing conventional two-lane highway to a four-lane expressway, which will improve the level of service (LOS), route continuity, ease congestion, and improve the overall operation of the highway.

This project proposes to construct a four-lane expressway on U.S. Highway (Hwy) 395 beginning just south of its junction with State Route (SR) 190 at post mile (PM) 29.2 to just north of the town of Cartago at PM 41.8, in Inyo County. Five build alternatives, and a “no-build” alternative are being considered. In the original 2003 NES, there were also five alternatives, and a no-build, however, Alternative 3A has been removed from consideration, and Alternatives 4 is now added.

In addition to the impacts resulting from the proposed alternatives, there will be 60 acres of impact resulting from the borrow site. The borrow site location will be mandatory for all alternatives and this 60 acres will be included in calculations for compensatory mitigation.

The following is a description of a design option (Alternative 2R), which has been dropped from consideration, and also a description of Alternative 4.

<u>Alternative 2R</u>

This option would have followed the same alignment as Alternative 2, except that the alignment would have continued past SR 190 (Pm 34.6) on the east side of the existing highway up to about PM 35.6, where it would have crossed back over to the west of the existing highway. Since this alignment would significantly reduce the right of way impacts, the cost of construction, and some of the environmental impacts in northwestern Olancha, it was reevaluated during the consideration of alternatives for this project. However, wetlands were determined to be present in the pasture lands north of SR 190 and east of the existing highway. Since jurisdictional wetlands must be avoided, this alternative was removed from consideration.

<u>Alternative 4</u>

This alternative would construct a controlled access four-lane divided expressway for the entire length of the project. The new expressway would be constructed west of the Los Angeles Aqueduct and would pass to the west of both Olancha and Cartago. It would return to the existing highway north of Cartago and continue to follow the existing alignment to the end of the project, incorporating the existing lanes into the new facility.

The proposed segments of this alternative are as follows:

- Begin work – 1.4 miles south of L.A. Aqueduct Bridge, #48-10 (PM 29.9). The existing lanes would be rehabilitated for use as northbound and southbound lanes.

- 1.3 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.0) new northbound and southbound lanes will be constructed to the west of the existing highway and will pass west of Olancha and Cartago.

- 1.3 miles north of Whitney Street (PM 39.1) the existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 2.3 miles north of Whitney Street (PM 40.1) the existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.

- End work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 41.9).

The proposed project would have several positive and beneficial impacts associated with improving the level of service (LOS) including: removing passing restrictions, separating opposing traffic, providing adequate shoulder widths for disabled vehicles and bicycle traffic, provide emergency parking areas and improving drainage. The proposed project would address all deficiencies of the existing facility. All features would meet current standards for a design speed of 80 mph.

Table 1 below lists the impacts to each species or community by alternative.

Table 1: Impacts for Alternative 2R and 4

Species or Community	Alternative 2R	Alternative 4
Area of disturbance within right-of-way in acres (ac)		
Freemont Cottonwood Series	No further studies completed	2.4
Wetlands/WOUS	25.95	2.02
Mojave ground squirrel	No further studies completed	236 + 60 (borrow site)
Desert tortoise	No further studies completed	236 + 60 (borrow site)

Permits Required

There are several waterways that cross and will be affected by the proposed project. These waterways include Cartago Creek, Olancha Creek, South Ash Creek, Braley Creek, Summit Creek, and multiple small, unnamed drainages.

- **Clean Water Act (CWA) Section 401 Permit** Issued by the Regional Water Quality Control Board (RWQCB), this permit requires Certification from the State that the discharge of fill material will not exceed water quality standards.

- **Army Corps of Engineers 404 Permit** Upon review of the Jurisdictional Determination Report the United States Army Corps of Engineers (USACE) will establish whether or not the affected waters are under their jurisdiction. If they are decidedly jurisdictional, a 404 permit will be required for the discharge of fill material to waters of the United States.

- **The California Department of Fish and Game (CDFG) Section 2081 Agreement** This permit is required for impacts to State threatened or endangered species.

- **CDFG Section 1602 Streambed Alteration Agreement** This permit is required for activities that will impact streams with defined beds, banks and channels.

Invasive Species

Executive Order 13112 (3 February 1999) calls for Executive Branch agencies to work to prevent the introduction and control the spread of invasive species, and eliminate or minimize their associated economic, ecological, and human health impacts. To prevent the introduction and spread of invasive species, Caltrans has issued policy guidelines, which provide a framework for addressing roadside vegetation management issues for construction activities and maintenance programs. There are a number of invasive species present in the project impact area including Giant reed (*Arundo donax*), wild oats (*Avena fatua)*, Italian ryegrass (*Lolium perenne)*, and Russian thistle (*Salsola tragus*). All of these species establish themselves in disturbed areas and may subsequently spread into undisturbed neighboring habitats.

Mitigation Strategies

- Caltrans proposes to mitigate for loss of wetlands and waters at a 1:1 ratio via the Cartago Springs Mitigation bank area being provided within Inyo County by the CDFG. A mitigation plan will be outlined once a preferred alternative is chosen.

- Desert tortoise and Mohave ground squirrel special provisions, which will require minimization measures such as pre-construction surveys, a worker education program, and construction monitoring, will be included in the construction contract.

- Caltrans proposes to compensate for permanent and temporary impacts to Mohave ground squirrel and desert tortoise habitat by preserving quality habitat in areas that are important for the recovery of these species. The land will be preserved and managed in perpetuity.

- Construction activities near existing structures that provide habitat for bats will be limited to daytime hours or specific times of the year, if necessary, to avoid potential impacts or disturbance to any bat species. All structures to be demolished will be surveyed for use by bats. If it is determined bats are utilizing any structures, demolition will be scheduled when bats are not present or exclusion measures will be incorporated to prevent any harm to bats.

- Migratory bird special provisions will be included and will require pre-construction surveys and minimization measures for Swainson's hawk.

- Environmentally Sensitive Area (ESA) special provisions will be included in the construction contract, which will require avoidance of sensitive areas.

- The construction contractor will comply with all requirements specified by CDFG and USFWS.

- Standard contract provisions and Best Management Practices (BMP's) will be implemented.

If Alternative 4 is chosen, at least two overcrossings for the Monache deer herd will be part of the final project design. CDFG will be consulted prior to acceptance of the final design.

Table of Contents

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List of Abbreviated Terms

BE	Biological Evaluation
BLM	Bureau of Land Management
BMP’s	Best Management Practices
BSA	Biological Study Area
BSR	Botanical Survey Report
Caltrans	California Department of Transportation
CalEPPC	California Exotic Pest Plant Council
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CTC	California Transportation Commission
CWA	Clean Water Act
CWUS	Culverted waters of the United States
dbh	diameter at breast height (~4 ft)
DOT	United States Department of Transportation
EPA	Environmental Protection Agency
ESA	Environmentally sensitive area
ESRP	Endangered Species Recovery Program
F	Fahrenheit
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
ft	foot/feet
GPS	Trimble Geo-XT© Global Positioning System
HCP	Habitat Conservation Plan
Hwy	United States Highway
IBA	Important bird area
LA	Los Angeles
LADWP	Los Angeles Department of Water and Power

LOS	Level of service
MGS	Mohave ground squirrel
mi	mile(s)
Mph	Miles per hour
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NOAA Fisheries	National Marine Fisheries Service
NMFS	National Marine Fisheries Service
NWL	noxious weed list
OHWM	Ordinary high water mark
OWUS	Other waters of the United States
PM	post mile
PIA	Project Impact Area
Quads	United States Geological Survey 7.5" quadrangle topographic map
ROW	Caltrans Right of Way
RWQCB	Regional Water Quality Control Board
SR	State Route
SWCA	Morro Group, a Division of SWCA
SWHA	Swainson's hawk
TNW	Traditionally navigable waterway
USGS	United States Geological Survey
URS	URS Corporation
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WL	Wetlands
WOUS	Waters of the United States

Chapter 1. Introduction

1.1. Project History

Caltrans and the FHWA are proposing to construct a new four-lane highway in Inyo County on U.S. Highway 395 (Hwy 395) near the communities of Olancha and Cartago (Olancha/Cartago Four-Lane Project). The proposed project would extend from the existing four-lane highway segment just south of the Los Angeles Aqueduct (L.A. Aqueduct) Bridge (No. 48-10) at Post Mile (PM) 29.2 to just north of the four-lane segment of Hwy 395 at the Ash Creek Bridge (No. 48-11), PM 41.8.

The Caltrans District 9 Transportation Planning Branch initiated the project with support from the Inyo County Local Transportation Commission to upgrade the existing two-lane conventional highway to a four-lane expressway, or to a partial conventional four-lane highway/partial expressway mix. Five build alternatives and a no action alternative is under consideration.

1.2. Project Description

The proposed project will upgrade the existing conventional two-lane highway to a four-lane expressway, which will improve the LOS, route continuity, ease congestion, and improve the overall operation of the highway.

This project proposes to construct a four-lane expressway on SR 395 beginning at postmile 29.2 in and near Olancha and Cartago, and ending at postmile 41.8 (Figure 1 & 2). Five build alternatives, and a “no-build” alternative is being considered. In the original 2003 NES, there were five alternatives, and a no-build. Alternative 3A has been removed from consideration, and Alternative 4 is now added.

Figure 1: Project Vicinity Map

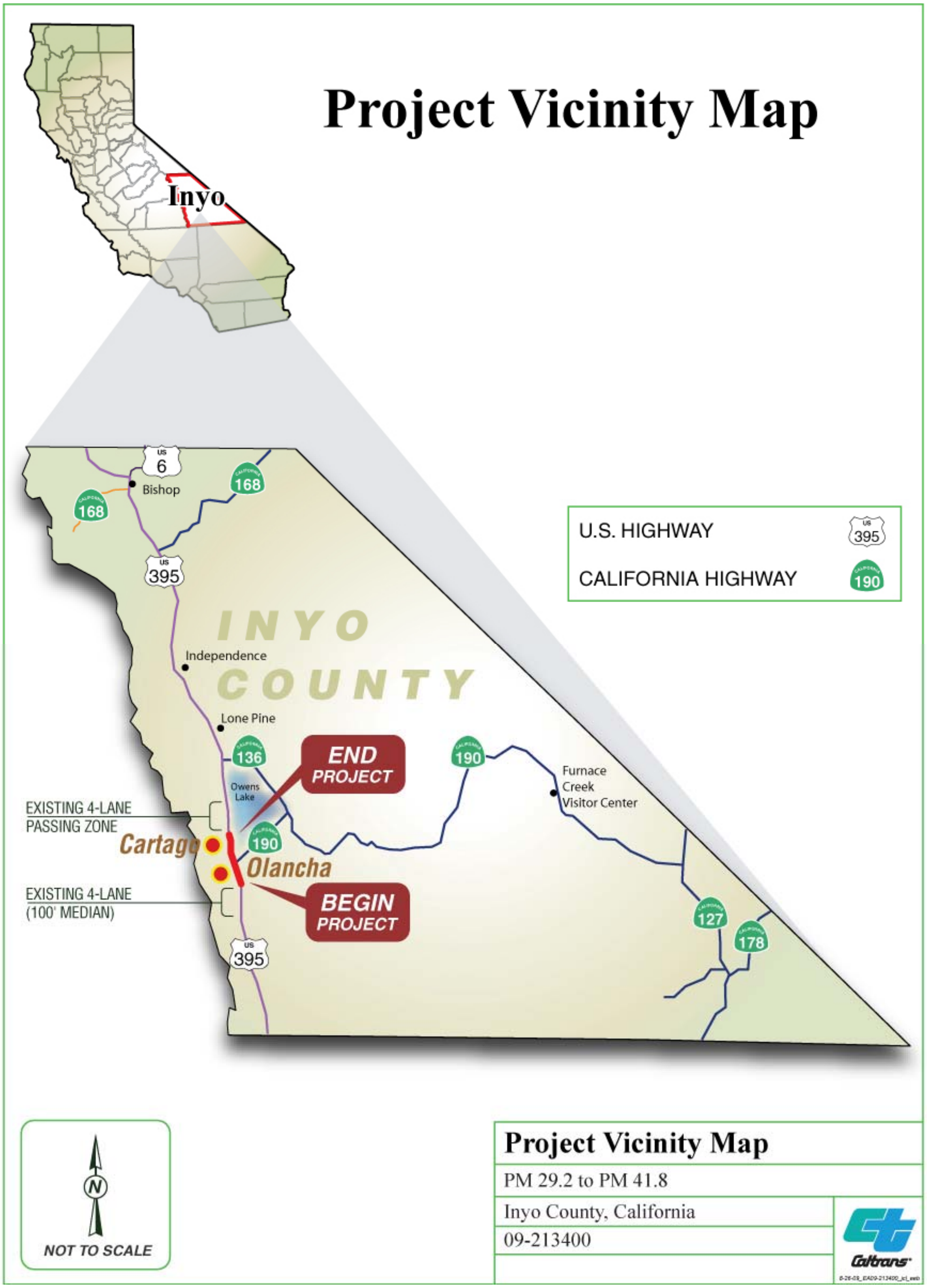


Figure 2: Project Location Map

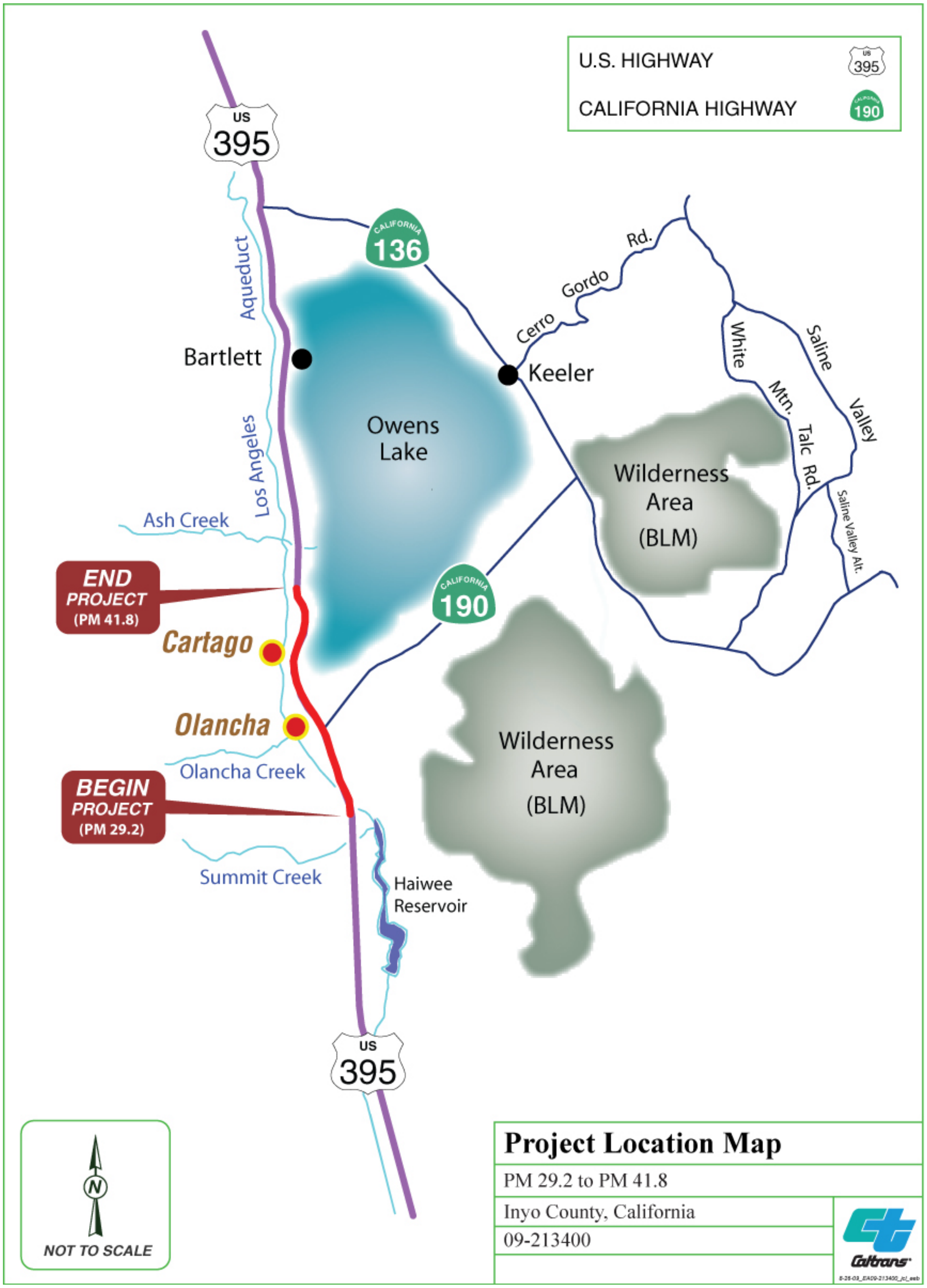
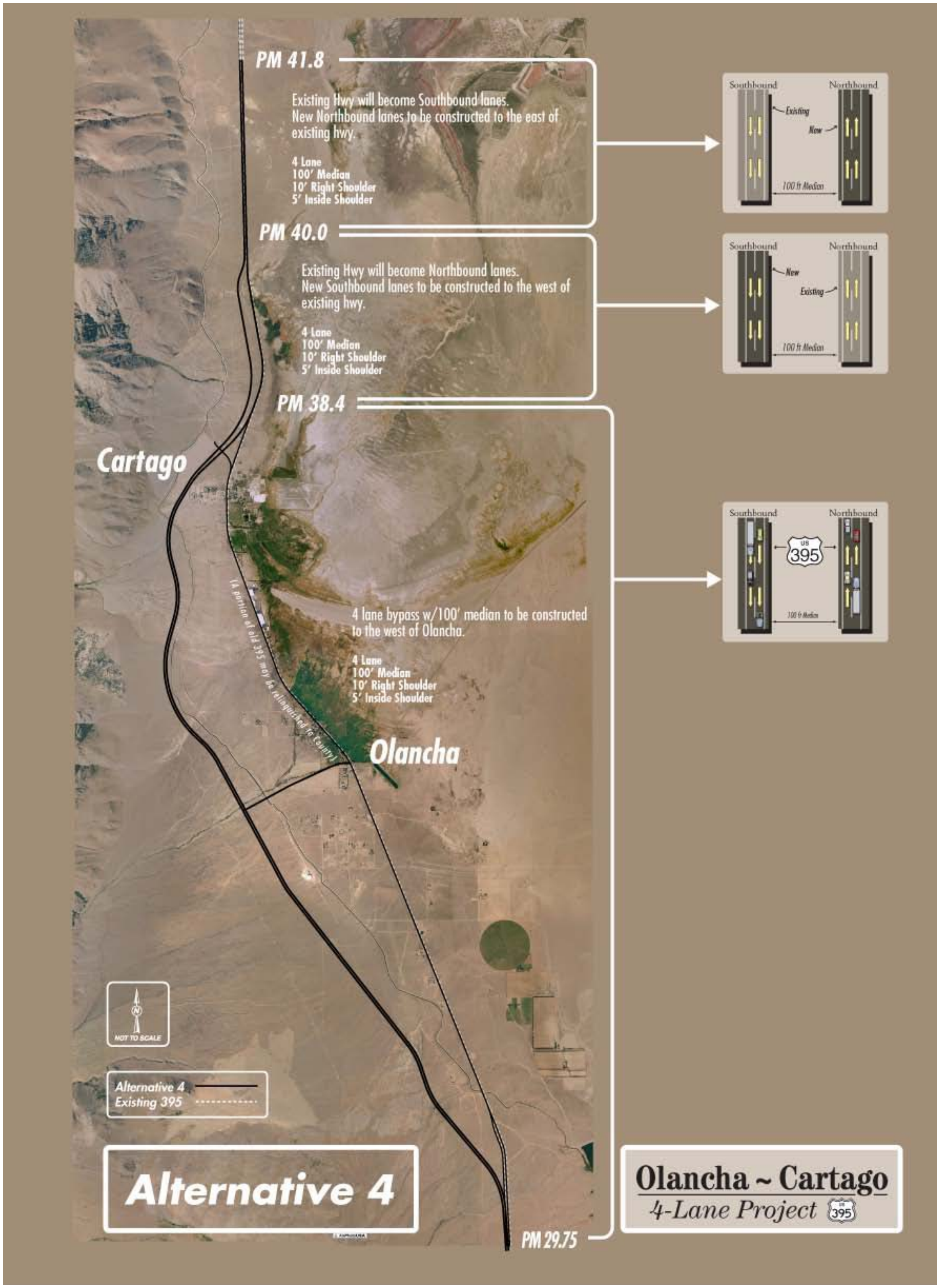


Figure 3: Proposed Alignment for Alternative 4



The following is a description of a design option (Alternative 2R), which has been dropped from consideration, and also a description of Alternative 4.

<u>Alternative 2R</u>

This option would have followed the same alignment as Alternative 2, except that the alignment would have continued past SR 190 (Pm 34.6) on the east side of the existing highway up to about PM 35.6, where it would have crossed back over to the west of the existing highway. Since this alignment would significantly reduce the right of way impacts, the cost of construction, and some of the environmental impacts in northwestern Olancha, it was reevaluated during the consideration of alternatives for this project. However, wetlands were determined to be present in the pasture lands north of SR 190 and east of the existing highway. Since jurisdictional wetlands must be avoided, this alternative was removed from consideration.

<u>Alternative 4</u>

This alternative would construct a controlled access four-lane divided expressway for the entire length of the project. The new expressway would be constructed west of the Los Angeles Aqueduct and would pass to the west of both Olancha and Cartago. It would return to the existing highway north of Cartago and continue to follow the existing alignment to the end of the project, incorporating the existing lanes into the new facility.

The proposed segments of this alternative are as follows:

- Begin work – 1.4 miles south of L.A. Aqueduct Bridge, #48-10 (PM 29.9). The existing lanes would be rehabilitated for use as northbound and southbound lanes.

- 1.3 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.0) new northbound and southbound lanes will be constructed to the west of the existing highway and will pass west of Olancha and Cartago.

- 1.3 miles north of Whitney Street (PM 39.1) the existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 2.3 miles north of Whitney Street (PM 40.1) the existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.
- End work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 41.9).

Table 2: Construction Equipment

Road Construction Equipment	Road Construction Purpose
Asphalt paver/roller	Asphalt-concrete delivery/placement
Backhoe	Soil manipulation and drainage work
Bulldozer/loader	Earthwork construction, clearing and grubbing
Dump truck	Asphalt-concrete removal from work site
Excavator with a bucket	Soil manipulation
Flat-bed truck	Drainage work
Front-end loader	Dirt or gravel manipulation
Motor grader/Blade	Ground leveling
Haul truck	Earthwork construction, clearing and grubbing
Paint/striping truck	Pavement stripping/delineation
Pavement roller	Pavement construction
Roller/compactor	Earthwork construction
Roller screeds	Pavement construction
Saw cutting/striping equipment	Pavement construction
Truck with seed sprayer	Landscaping
Water truck	Earthwork construction and dust control
Bridge Construction Equipment	**Bridge Construction Purpose**
Backhoe	Soil manipulation and drainage work
Bidwell screeds	Bridge pavement construction
Bobcat	Pavement construction
Compressor	Bridge structure construction
Concrete pump	Pavement construction
Concrete truck mixers	Pavement construction
Crane (rubber tire and large crawler)	Bridge foundation and concrete superstructure construction.
Haul truck	Asphalt-concrete delivery
Excavator with a bucket	Soil manipulation
2 Excavators with a hoe ram	Bridge removal Demolition and pile driving
Forklift or Telescopic Handlers	Moving supplies and equipment
Front-end loader/skip loader	Dirt or gravel manipulation
Genie man lift	Bridge structure construction
Haul truck	Earthwork construction, clearing and grubbing
Concrete Pavement Grinder	Bridge structure construction
PCC Pump truck	Bridge structure construction
Ready-mix truck	Concrete delivery
Water truck	Earthwork construction and dust control

Chapter 2. Study Methods

2.1. Regulatory Requirements

2.1.1. National Environmental Policy Act /California Environmental Quality Act

The National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.) establishes a mandate for Federal agencies to consider the potential environmental consequences of their proposals, document the analysis, and make this information available to the public for comment prior to implementation.

The California Environmental Quality Act (CEQA) (P.R.C. 21000 et seq.) establishes State policy to prevent significant impacts to the environment by requiring alternative analysis and mitigation measures. CEQA applies to actions directly undertaken, financed, or permitted by State lead agencies.

2.1.2. Wetlands and Other Jurisdictional Waters of the United States

Wetlands and other jurisdictional waters of the United States (WOUS) are protected by several Federal and State laws and regulations. The Clean Water Act (CWA) (33 U.S.C. 1251-1376) provides Federal protection by regulating the discharge of dredged or fill material into wetlands orWOUS.

WOUS include all waters which in the past were, currently are or may be used in the future for interstate or foreign commerce, including intermittent streams, wetlands, and all waters subject to the ebb and flow of the tide. Wetlands are generally under normal circumstances classified as jurisdictional when they meet three specific requirements which include the presence of hydrophytic (water loving) vegetation, hydric soils (soils prone to saturation or inundation), and wetland hydrology.

Section 404 of the CWA gives the USACE authority to issue permits for the discharge of dredged or fill material in WOUS including wetlands provided the Nation’s waters would not be significantly degraded and it’s the most pracitcable alternative. This section also provides the United States Environmental Protection Agency (EPA) the authority to issue guidelines for implementation of this section as well as veto power over USACE permit decisions.

Executive Order 11990 Protection of Wetlands (May 24, 1977) also establishes policy that on Fedrally funded projects, effects on wetlands must be described in the environmental document and alternatives that avoid wetlands must be considered. If wetland effects cannot be avoided, then all practicable measures to minimize harm must be included. The U.S. Department of Transportation (DOT) announced DOT Order 5660.1A in 1978 to comply with this direction and the FHWA reviews environmental documents for compliance.

State protection over wetlands and other waters of the State is regulated primarily by the California Department of Fish and Game (CDFG) and the Regional Water Quality Control Board (RWQCB). Section 1602 of the CDFG code requires notification prior to any activities that may substantially alter the flow, bank, depth, or channel of any lake or stream. If it is determined that the proposed activitiy may adversely affect fish or wildlife resources a Lake or Streambed Alteration Agreement will be necessary from CDFG which incorporates minimization and/or mitigation measures into the constuction contract to ensure the project is in compliance with CEQA.

Section 401 of the CWA requires that any applicant of a Federal license or permit allowing the discharge of dredged or fill materials into WOUS including wetlands, must first acquire certification from the State agency responsible for and having jurisdiction over those waters. The RWQCB, established by the Porter-Cologne Water Quality Control Act, is the agency responsible for making that determination and issuing 401 Certifications in California.

2.1.3. Plant Species

Plants with special status are provided protection by several Federal and State laws and regulations. While many plants are grouped into special status terms, there are vaying levels of that status and some involve greater protection than others.

The Federal Endangered Species Act (FESA)(16 U.S.C. 1531-1543) provides protection for plant species listed as threatened, endangered, or candidate species that may be proposed for listing. Section 9 of the FESA prohibits the taking of listed species, however, there are two sections (7 and 10) of the FESA that provide authorization of take when that take is incidental to an otherwise lawful activity.

Section 7 of the FESA provides that Federal agencies consult with agencies responsible for administiring FESA, either the USFWS or National Marine Fisheries Service (NMFS) depending on the species in question, to ensure that actions they authorize are not likely to jeopardize the continued existence of listed species or adversely modify critical habitat of those species.

Section 10 of FESA establishes a process where a non-federal entity may be allowed take of a listed species when that take is incidental to an otherwise lawful activity. This section also requires that an Habitat Conservation Plan (HCP) be submitted.

The California Endangered Species Act (CESA)(Fish and Game Code 2050 et seq.) establishes policy of the State to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA provides that State agencies shall not authorize actions that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There is no mandated consultation process under CESA. As in the FESA there are sections which may allow take provided the take is incidental to an otherwise lawful activity. The first section (2080.1) is used when a species is listed as threatened or endangered by both FESA and CESA. This section must determine that an incidental take permit issued for a Federally listed species is consistent with provisions in CESA, and as such is termed a "consistency determination". If this determination is met no further action is necessary and the take of State listed species is also authorized by the Federal incidental take permit. In the case of a State only listed species or in the event a Federal incidental take permit is determined to be inconsistent with CESA then Section 2081 provides a means where a State listed species may be taken provided that take is incidental to an otherwise lawful activity. Section 2081 also requires that any impacts of the authorized take be fully mitigated.

In addition to protection afforded by FESA and CESA rare native plants are provided protection by the California Native Plant Protection Act, CDFG code, sections 1900-1913. CDFG code, sections 1925-1926 also protects native plants of the California desert by enforcing provisions of the California Desert Native Plant Act (Food and Agriculture Code 80001-80006). This act protects California desert native plants from unlawful harvesting on both public and privately owned lands.

Special consideration must also be given to native plants designated by the California Native Plant Society (CNPS) as rare, threatened, or endangered in California.

2.1.4. Animal Species

As discussed above for plant species, both CESA and FESA provide protection for animal species and follow the same processes as the protections for plant species, including the consultation mandated by FESA and the need for either a consistency determination (with dual listed species) or 2081 permit when the proposed activity involves take of a State only listed species.

The Migratory Bird Treaty Act (16 U.S.C. 703-711) provides protection for all migratory birds, their nests, eggs and feathers and makes it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill shared migratory bird resources. This act does not provide any means where take is authorized.

There are also several CDFG Codes that provide protection for animal species. Sections 3511, 4700, 5050, and 5515 all designated certain species as fully protected species. There is no take authorization available for species listed as fully protected. Section 4150 provides protection for all nongame mammals such as bats. There are take authorizations exempting parties from this section provided it can be proved that the nongame mammals are injuring crops or other property.

2.1.5. Invasive Species

Executive Order 13112 Invasive Species (February 3, 1999) requires Federal agencies to work cooperatively to prevent and control the spread of invasive plants and animals. Caltrans has issued guidance in order to comply with this order and requires that a NEPA analysis for an action include an analysis of the probability of the action to cause or promote the introduction or spread of invasive species.

2.2. Studies Required

In order to determine potential studies that may be required as part of the proposed project, a literature review is completed first. This review identifies potential sensitive resources that may require further evaluation. Secondary to a literature review is a reconnaissance level field visit to verify information discovered during the literature review and either confirm or discount the need for further studies pertaining to specific species or sensitive communities. Finally specific studies or protocol level surveys are performed to further verify presence or absence of sensitive resources. These studies also include general plant and animal species inventories, as well as wetland delineations, when applicable.

2.2.1. Literature Review

Listed below are resources that were used to develop a list of special-status plant and wildlife species and plant communities that could potentially occur within the survey area and to identify appropriate survey protocols for use in conducting biological surveys.

As part of the environmental studies for the proposed project a *Botanical Survey Report* (BSR) by Morro Group, a Division of SWCA (SWCA) was prepared for Caltrans. In addition to the BSR, URS Corporation (URS) prepared a *Jurisdictional Delineation Report for the Olancha/Cartago 4-Lane Project* (Jurisdictional Report) for Caltrans in 2009. Elements from both reports were used in the preparation of this document, and sources of literature reviews for those documents are listed below as well.

- The U.S. Fish and Wildlife Service Threatened and Endangered Species List originally obtained in June 2002 and updated in March 2010 (Appendix C).
- California Natural Diversity Database (CNDDB) search of all affected U.S. Geological Survey (USGS) 7.5-minute quadrangles in which the project is located (Bartlett, Haiwee Reservoirs, Olancha, and Vermillion Canyon) as well as adjacent quadrangles (Centennial Canyon, Haiwee Pass, Keeler, Lone Pine, Owens Lake, and Upper Centennial Flat 7.5. quadrangles) updated February 2010.
- California Native Plant Society’s (CNPS) Inventory of Rare and Endangered Vascular Plants of California (Online v7-10a 1-19-10).
- Existing Natural Environment Study (NES) and Biological Evaluation (BE) completed in 2003 by Caltrans for previously identified alternatives.
- Personal Communication with agencies, such as CDFG, and USACE.

The following are sources used in the literature review of the BSR.

- CNDDB (2008) search of USGS quadrangles (Olancha, Cirque peak, Bartlett, Owens Lake, Vermillion Canyon, Haiwee Resevoir, Haiwee Pass, Monache Mountain, and Templeton Mountain)
- CNPS Electronic Inventory of Rare and Endangered plants of California (2008)

- CalFlora (an online resource for plants growing wild in California, both native and introduced)
- Existing NES and BE prepared in 2003.

The following are sources used in the literature review of the Jurisdictional Report.

- Aerial photographs of the project site and vicinity
- Soil Survey of Inyo County, California (1978) U.S. Department of Agriculture (USDA)
- National List of Vascular Plant Species That Occur in Wetlands (USFWS)

2.2.2. Study Area

The biological study area (BSA) comprised a large corridor beginning just south of the Los Angeles Aqueduct Bridge No. 48-10 at PM 30.8 and going north to the Ash Creek Bridge No. 48-11 at PM 41.9. The western boundary extends just past the Los Angeles aqueduct and the high-voltage transmission line located at the north end of the project. The eastern boundary was 200 ft from the existing pavement. The area comprises 3,392 ac. See Figure 2 of the Original NES (June 2003) and Figure 4 of the Jurisdictional Delineation Report (Appendix B) for the biological study area.

2.2.3. Reconnaissance Surveys

Reconnaissance surveys were completed by Caltrans biologists to verify information discovered during the literature review and either confirm or discount the need for further studies pertaining to specific species or sensitive communities. These surveys consisted of driving the project area and documenting existing habitat. This information was then utilized to identify areas that may require more focused studies.

2.2.4. Botanical Surveys

Botanical surveys were conducted as part of the BSR that was completed for Caltrans in 2008. The information below was taken from that report, please see appendix A for the complete report.

Due to the size of the BSA and wide spectrum of flowering periods, botanical surveys were divided into three separate events. Each of these consisted of approximately five days of survey effort. Combined the surveys took place from April 7 to June 6, 2008. During the surveys parallel transects were walked throughout the BSA. To ensure maximum coverage and to avoid overlap, Trimble Geo-XT© Global Positioning System (GPS) units were pre-programmed with transect routes and boundaries of the BSA.

In accordance with CDFG guidelines, the timing of all three surveys was such that sensitive plants with the potential to exist within the BSA would be flowering during the survey period, allowing for positive identification of the species if observed. A complete list of plant species observed is contained in Attachment B of the BSR.

2.2.5. Desert Tortoise Surveys

Protocol surveys for desert tortoise were approved by the USFWS and conducted as part of the NES/BE written in 2003, and information from that report is included in this NES. The surveys took place in June of 2001 and were intended on walking 100% of the project site using 30-ft wide transects. Buffer transects were also intended to be completed as part of the surveys consisting of 30-ft transects walked at 100, 300, 600, 1200, and 2400 ft from and parallel to the project site. Because of limited property access the original survey plan was modified and included 100% cover of properties allowing access.

Monitoring for any signs of desert tortoise was also conducted during the wetland and WOUS delineations.

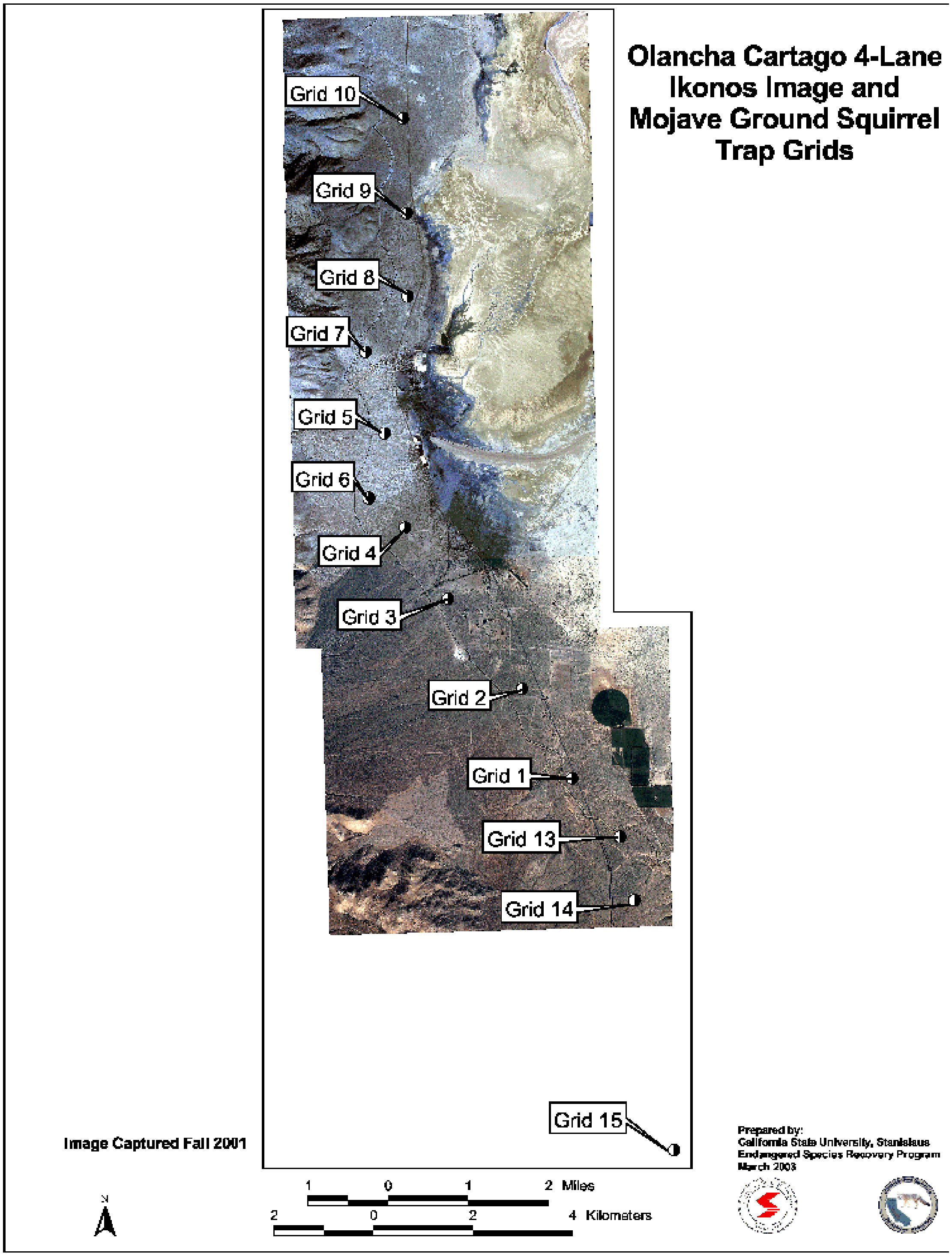
On all surveys, tortoise surveyors were instructed to record and describe all tortoise sign (e.g., individuals, dens, burrows, scat, tracks, pellets, skeletal remains). The survey area was photo documented and described relative to topography, drainage type, soils, substrate, aspect dominant, common and occasional plant species, plant cover (estimated visually), and anthropogenic disturbances.

2.2.6. Mohave Ground Squirrel Surveys

Reconnaissance level surveys and trapping for Mohave ground squirrels was conducted as part of the NES/BE written in 2003, and information from that report is included in this NES. During the reconnaissance surveys it was determined that potential habitat existed within the project limits. Much of this area is characterized by deep, fine-grained alluvial soils that provide a good substrate for rodent burrows. The vegetation is typical of that found in many areas of the western Mohave desert where Mohave ground squirrels have been reported. Saltbush species, such as shadscale (*Atriplex confertifolia*) allscale (*A. polycarpa*), and creosote bush (*Larrea tridentata*) dominate the shrub community in the project area west of HWY 395. Shrub species richness is high throughout much of this area, with 15-19 shrub species noted at a number of sites.

Based on the reconnaissance surveys, 10 sites were selected for trapping based upon habitat suitability, access, lack of development or human disturbance, and distribution throughout the length of the project area and are illustrated in Figure 4.

Figure 4: Mohave Ground Squirrel Trapping Grids



(The Endangered Species Recovery Program (ESRP) created this Figure for the NES/BE written in 2003.)

These sites were on undeveloped lands to the west of the existing Hwy 395 alignment. Trapping grids were placed about 1 mile apart and were selected to include all suitable habitats present within the study area. They occurred on lands owned by BLM and Los Angeles Department of Water and Power (LADWP), and on private parcels whose owners had given written permission for access. All sites supported desert shrub communities that appeared to provide suitable habitat for the Mohave ground squirrel.

During 2002, based on the apparent absence of Mohave ground squirrels after negative trapping results in the study are during 2001 and after consultations with CDFG, trapping efforts were extended further south, well out of the project area. This was done in an attempt to locate the nearest Mohave ground squirrel population. Reconnaissance was conducted to locate suitable habitat and potential trapping grids. Three areas south of the LA Aqueduct Bridge No. 48-10, east of Hwy 395, and west of Haiwee Reservoir were identified as trapping grid locations.

The trapping grids comprised 100 trap stations arranged in four parallel lines of 25 stations each, with traps and traplines separated by 82 ft in 2001 and 115 ft in 2002. Field personnel set up each grid by pacing all distances and placing a wire flag at each trap station. A single Pymatuning, Sherman, or Tomahawk live trap was positioned near each trap station. During the April trapping sessions, all traps were placed under shrubs to provide shade. In May, cardboard covers were placed over traps. In 2001, each grid formed a rectangle measuring 246 X 1969 ft, with an area of 11.1 acres. In 2002, each grid formed a rectangle of 344 X 2789 ft, with an area of 22 acres. The area actually sampled by each grid included a boundary strip around the outer trap stations.

Traps were baited with a commercially available horse feed made up of a mixture of grains (oats, corn, wheat, and barley) coated with molasses. A powdered mixture of rolled oats and peanut butter was added to provide an odor. All ground squirrels captured were identified to species. When captured, Mohave ground squirrels and white-tailed antelope squirrels (*Ammospermophilus leucurus*) were marked on the belly with a red marking pen when possible, so that the number of individuals captured could be specified. They were examined for sex, age, and reproductive condition and then released at the point of capture. During both the April and May sampling periods, trapping was carried out for five consecutive days on each of the 10 trapping grids. In 2001, trapping was done on grids 1 through 10. During the first trapping session in 2002, trapping was done on grids 1-4, 6, 7, 10, and three grids south of the study area, numbered 13, 14, and 15. During the second trapping session trapping was done on grids 1-10. Traps were opened in the morning between 7:45-9:45 (am) and closed in the afternoon between 4:00 and 6:00 (pm).

Weather conditions were monitored during the sampling periods. The weather was generally favorable for this type of field survey. Daily high temperatures in April were generally 60-67º Fahrenheit (F), skies were clear to partly overcast, and winds ranged from zero to 11 miles per hour (mph). A storm on April 9, 2001, reduced daily high temperatures to 51-55ºF and produced occasional snow flurries. On four days, wind speeds up to 29mph were recorded although these speeds were not sustained for more than a few hours. During May, weather conditions were also generally goood. Daily maximum temperatures ranged from 80-97ºF, skies were clear to partly overcast, and wind velocities ranged from zero to about 11mph. On May 12, 2001, a storm resulted in a daily high of 72ºF and completely overcast skies with occasional light rain.

2.2.7. Swainson's Hawk Surveys

Surveys for Swainson's hawks were conducted on March 18 and 24 of 2001 as part of the studies for the NES/BE written in 2003. The surveys were conducted from 6:30 to 9:30 (am) and 4:00 to 6:00 (pm) and timed before trees had leafed out. The project area was driven and walked in an effort to locate any stick nests in trees, and for visual identification of Swainson's hawks or other raptors. Raptors were also watched for during other elements of the project (e.g. desert tortoise surveys, Mohave ground squirrel trapping) between April, May, and June of 2001.

While there is no published survey protocol for Swainson's hawks, there are recommendations concerning timing and methodology presented by the Swainson's Hawk Technical Advisory Committee (May 31, 2000) that were consulted. Survey recommendations included conducting surveys from mid-March to mid-April to detect staging pairs. Morning surveys are preferred although evening surveys may be successful because Swainson's hawks are likely to be sitting in their staging trees at those times. Surveys during mid-day are less successful because Swainson's hawks typically soar high and far from nest sites.

Surveys will be performed again prior to construction following these recommendations to further reduce the potential for impacts to Swainson's hawk.

2.2.8. Wetlands and Waters of the United States Delineation

URS biologists conducted a detailed investigation of the BSA from April 28 to May 6, 2009. The survey consisted of vehicle tours of the BSA on all accessible roads, and walking surveys along potentially jurisdictional drainage features. The field delineation was conducted north to south by traveling along Hwy 395, the eastern boundary of the majority of the BSA. Features identified along Hwy 395 were surveyed and further investigated on foot based upon an analysis of potential connectivity to the historical extent of Owens Lake, the closet traditionally navigable waterway (TNW). Specifically, existing landforms, vegetation, hydrology, and soil conditions were evaluated to identify potential wetlands and other waters of the U.S. within the BSA.

The delineation of jurisdictional wetlands in the BSA followed the methods described in the USACE *Wetlands Delineation Manual* (1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Supplement* (2008). The delineation of jurisdictional other waters in the BSA followed the methods described in *A Field Guide to the Identification of the Ordinary High Water mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008).

Vegetation, soil, and hydrology parameters in the field were analyzed to determine the locations and boundaries of USACE jurisdictional wetlands within the BSA. During the site visit, paired data points were recorded in suspected wetland areas and corresponding upland areas, and test pits were dug at each point to determine hydrology and soil conditions at those points. Locations of wetland data points were recorded by hand on aerial photographs and then again using a handheld GPS unit with sub-meter accuracy. All points were examined using the three-parameter USACE approach. Connectivity for each potential wetland feature was analyzed in the field and relevant connective features such as culverts and off-site drainage pathways were mapped.

All features that potentially met USACE criteria for wetlands were recorded as line, point, or polygon features using the GPS unit and/or aerial photographs. After evaluating the hydrology, soils, and vegetation at all of the data points, recorded on Arid West Delineation Manual data sheets (USACE 2008), the boundaries of wetlands were extrapolated by following topographic contours, wetland vegetation boundaries, and clear hydrologic boundaries. Acreages for USACE wetlands were calculated from digitized data in ArcGIS software and coded with the “WL” acronym.

The USACE OHWM delineation manual, which offers an approach for identifying the lateral limits of low-gradient, alluvial ephemeral/intermittent channel forms in the Arid West, was used to guide the delineation of other waters in the BSA. Prior to stating delineation work, URS GIS specialists produced aerial figures and topographic maps of the BSA and vicinity, which indicated the location of all the washes present, within, and surrounding the project alternatives.

For a drainage feature to be considered jurisdictional, URS biologists determined the feature would need to cross Hwy 395 in an established channel and reach the historical Owens Lakebed either through a defined channel, a jurisdictional wetland feature, or within 100 feet of the historical lakebed.

URS biologists examined each individual culvert along Hwy 395 and its respective inflow and outflow channel forms to see whether the feature draining through the culvert could have a significant nexus with Owens Lake, a potential TNW. URS biologists recorded information for each culvert and drainage, by taking GPS points, field notes, and photographs.

2.3. Personnel and Survey Dates

Survey Description	Date	Personnel
Botanical	April 7-11, 2008	Jon Claxton, Travis Belt, Barret Holland (SWCA biologists)
Botanical	April 21-26, 2008	Jon Claxton, Travis Belt, Barret Holland (SWCA biologists)
Botanical	June 2-6, 2008	Jon Claxton, Travis Belt, Barret Holland (SWCA biologists)
Reconnaissance	March 24, 2009	Keri O’Connor (Caltrans biologist), Theresa Stevens (USACE)
Wetlands/waters, incidental wildlife	April 2009	Jan Novak (URS Senior Soil Scientist), Galen Peracca, Jessie Golding, Katherine Caldwell, Ivan Parr, and Flethcher Halliday (URS biologists)

2.4. Agency Coordination and Professional Contacts

2.4.1. United States Fish and Wildlife Service

An official list of federally endangered and threatened wildlife and plant species that may be affected by the proposed project was obtained from the USFWS Ventura Office in June 2003 (Appendix C) and updated in March 2010.

2.4.2. California Department of Fish and Game

A database search of State listed species from the CDFG-maintained California Natural Diversity Database (CNDDB) was conducted and updated in 2009 (Appendix D).

Caltrans consulted with Tom Stevenson of the CDFG Bishop Office regarding the potential for Sierra Nevada Bighorn Sheep to be affected during proposed project activities. In an e-mail dated August 14, 2008 (Appendix E), Mr. Stevenson stated that after consulting with his colleagues, it was determined the area is not particularly sensitive and they would not expect a high level of use by bighorn sheep.

Caltrans consulted with Rocky Thompson, CDFG biologist, regarding the migration of the Monache deer herd and providing deer crossings with Alternative 4.

2.4.3. Army Corps of Engineers

A field review was conducted on March 24, 2009, with USACE liaison Theresa Stevens to review the project area.

A wetland and WOUS delineation report was submitted to USACE for verification on December 3, 2009.

2.5. Limitations That May Influence Results

2.5.1. General Limitation

The survey area includes government-owned (BLM, City of Los Angeles) and private land. Some individuals have refused to allow access to their property and therefore some areas have not been surveyed.

2.5.2. Vegetation Surveys

Some areas were not likely to contain sensitive species due to their degraded condition caused by development, off highway vehicle disturbance, or livestock grazing.

2.5.3. Wildlife Surveys

Additional protocol surveys for desert tortoise and Mohave ground squirrel were not performed as part of Alternative 4, however the impact and study areas fall within the same range as previous studies for other Alternatives and therefore previous sightings and trapping results will be utilized.

Chapter 3. Results: Environmental Setting

3.1. Description of the Existing Biological and Physical Conditions

3.1.1. Study Area

The biological study area comprised a large corridor beginning just south of the Los Angeles Aqueduct Bridge No. 48-10 at PM 30.8 and going north to the Ash Creek Bridge No. 48-11 at PM 41.9. The western boundary extends just past the Los Angeles aqueduct and the high-voltage transmission line located at the north end of the project. The eastern boundary was 200 ft from the existing pavement. The area comprises 3,392 ac. See Figure 2 of the original NES (June 2003) and Figure 4 of the Jurisdictional Delineation Report (Appendix B) for the biological study area.

3.1.2. Physical Conditions

Owens Valley is approximately 75 miles long, trending north-south, and is bounded by the Inyo Mountains on the east, on the southeast by the Coso Range, on the south by Rose Valley, on the west by the Sierra Nevada, and on the north by Chalfant Valley. The mountains on either side (including Mount Whitney) reach above 14,000 feet in elevation, while the floor of the Owens Valley is at 4,000 feet, making the valley one of the deepest in the United States. The proposed project lies near Owens Lake, now a dry alkali flat. The valley provides water to the Los Angeles Aqueduct, the source of one-third of the water for Los Angeles.

The Owens Valley stretches from Haiwee Reservoir in the south to the Sherwin Summit in the north (just north of the town of Bishop). Other towns in the Owens Valley include Lone Pine, Independence and Big Pine. SR 395 is the major route through the Valley.

3.1.3. Biological Conditions in the Biological Study Area

There are 10 natural plant communities in the study area and an agricultural field planted with alfalfa. These are named and discussed below according to the classification of Sawyer and Keeler-Wolf (1995). Equivalent plant community classifications according to the CNDDB (2002b) and Holland (1986) are presented in Appendix B of the original NES (JUNE 2003). Developed (urban) areas are also present in the study area; however, they will not be discussed further because they are not natural communities.

3.1.3.1. NATURAL COMMUNITIES

Alfalfa Field - The only alfalfa field in the study area occurs at Olancha, west of Highway 395 and south of Olancha Creek. This vegetation type is not a natural community. It consists of planted alfalfa (*Medicago sativa*) that is watered artificially. The alfalfa field occupies less area than any other plant community in the study area.

Big Sagebrush Series - This plant community occurs within Alternative 4 on the west side of Highway 395 from approximately 6 miles south of the northern edge of the study area southward to Olancha Creek. The Big Sagebrush Series is an upland vegetation type dominated by shrubs, with annual grasses and wildflowers in the ground layer. The dominant species is big sagebrush (*Artemisia tridentata*). Other typical species of this series observed in the study area are rabbitbrush (*Chrysothamnus* species) and green ephedra (*Ephedra viridis*). The shrub four-wing saltbush (*Atriplex canescens*) also is present but is not characteristic of the series. Annual herbs include cheatgrass (*Bromus tectorum*) and Wilcox's woolly-star (*Eriastrum wilcoxii*). The series is found on well-drained, gravelly soils in a variety of sites including valleys, dry washes, and alluvial fans (Sawyer and Keeler-Wolf 1995).

Bulrush Series - This community is found towards the northern end of the study area, east of the existing highway. The dominant species of this series are herbs, including common three-square (*Scirpus americanus*), Parish's spikerush (*Eleocharis parishii*), and Baltic rush (*Juncus balticus*); sedges (*Carex* spp.) are abundant but not dominant. Although this community includes elements of the Saltgrass Series (below) and Spikerush Series (Sawyer and Keeler-Wolf 1995), it is called the Bulrush Series here due to the importance of common three-square. The important species are primarily obligate wetland plants (Reed 1988). Additional species observed in the Bulrush Series within the study area include cow's clover (*Trifolium wormskioldii*), cut-leaf water-parsnip (*Berula erecta*), and a non-native plant, birds-foot trefoil (*Lotus corniculatus*). The Bulrush Series may be either permanently or seasonally flooded and may have either fresh, alkaline, or saline water chemistry (Sawyer and Keeler-Wolf 1995).

Creosote Bush Series - The Creosote Bush Series occupies a narrow strip more than 2 miles long, with its southern extent just north of Cartago. It is an upland vegetation type dominated by shrubs. The ground cover is sparse except for the presence of spring or summer annuals (Sawyer and Keeler-Wolf 1995). The dominant species in this series is creosote bush (*Larrea tridentata*). This series intergrades with the Shadscale Series in the study area, and thus many of the same plant species are present, although they are more characteristic of the Creosote Bush Series than the Shadscale Series (Sawyer and Keeler-Wolf 1995). Such species include hop-sage (*Grayia spinosa*), white bursage (*Ambrosia dumosa*), valley saltbush (*Atriplex polycarpa*), goldenbush (*Ericameria cooperi*), and cheesebush (*Hymenoclea salsola*). This community is found on droughty, well-drained soils of flats, slopes, alluvial fans, and valleys (Vasek and Barbour 1977, Holland 1986, Sawyer and Keeler-Wolf 1995). The study area represents the northern range limit for the Creosote Bush Series in the Owens Valley, although it continues farther north on the east side of Owens Lake (Kuchler 1977).

Fremont Cottonwood Series - This series occurs along Olancha and Cartago creeks, which are the primary local drainages flowing from the Sierra Nevada to the study area. The Fremont Cottonwood Series is typical of riparian areas, where soils are flooded intermittently by fresh water but remain saturated continuously (Sawyer and Keeler-Wolf 1995). The dominant species in the Fremont Cottonwood Series are trees. Fremont cottonwood (*Populus fremontii*), a facultative wetland species, dominates the overstory along the creek banks. Red willow (*Salix laevigata*), narrow-leaf willow (*S. exigua*), and black willow (*S. gooddingii*) are the dominant species in the understory, and thus this series is similar to the Mixed Willow Series (see below).

Greasewood Series - A small patch of the Greasewood Series is located just south of Olancha and immediately west of Highway 395 (Figure 7-NES June 2003). This vegetation type is dominated by the shrub greasewood (*Sarcobatus vermiculatus*), a facultative upland species (Reed 1988). This series is found on moist lakebeds and similar sites with saturated, saline soils that are flooded intermittently (Holland 1986, Sawyer and Keeler-Wolf 1995).

Mixed Saltbush Series - A distinct patch of this series occurs just south of Olancha Creek and south of the town of Olancha. In the study area, the Mixed Saltbush Series intergrades with the Shadscale and Greasewood series, a pattern that is common around the margins of dry lakes (Vasek and Barbour 1977). The Mixed Saltbush Series is a shrub-dominated community with a sparse ground cover (Sawyer and

Keeler-Wolf 1995). The dominants are shadscale (*Atriplex confertifolia*), four-wing saltbush, valley saltbush, and spiny saltbush (*Atriplex spinifera*). However, many other species are present, including those noted below under the Shadscale Series.

Mixed Willow Series - This vegetation community occurs in two small patches within the study area (Figure 7-NES June 2003). As is typical of the Mixed Willow Series, the soils in these areas are saturated with fresh water and the habitat is flooded seasonally (Sawyer and Keeler-Wolf 1995). Red willow, narrow-leaf willow, and black willow dominate the Mixed Willow Series in the study area. The last two are obligate wetland species; red willow is not listed in the National List of Plant Species That Occur in Wetlands (Reed 1988). Woody understory species include rabbitbrush and interior rose (*Rosa woodsii*). The ground layer comprises obligate wetland plants (Reed 1988) such as yerba mansa (*Anemopsis californica*), Baltic rush, and a hybrid cattail (*Typha x glauca*).

Rubber Rabbitbrush Series - This series is found in a small area along the west side of Highway 395 just north of Olancha Creek, where rubber rabbitbrush (*Chrysothamnus nauseosus*) is virtually the only plant species present. The Rubber Rabbitbrush Series intergrades with the Shadscale Series upslope to the west of Olancha. This vegetation type is found on well-drained, gravelly soils (Sawyer and Keeler-Wolf 1995) and is indicative of site disturbance (Holland 1986).

Saltgrass Series - This vegetation community occurs east of Highway 395, from Highway 190 northward. The Saltgrass Series is characterized by the presence of saltgrass (*Distichlis spicata*) as the dominant ground cover (Sawyer and Keeler-Wolf 1995). However, Baltic rush co-dominates in the study area. Other important plants found in this community include alkali sacaton (*Sporobolus airoides*) and yerba mansa. Additional species commonly observed in the Saltgrass Series within the study area (in order of abundance) include Bermuda grass (*Cynodon dactylon*), annual rabbit-foot grass (*Polypogon monspeliensis*), western borax-weed (*Nitrophila occidentalis*), and salt marsh bird's-beak (*Cordylanthus maritimus* ssp. *canescens*). This habitat is permanently saturated and has a shallow water table and saline water chemistry (Sawyer and Keeler-Wolf 1995). The dominant and other important species observed in the study area have been characterized as obligate or facultative wetland plants (Reed 1988).

Shadscale Series - This series is the most widespread vegetation type in the study area, accounting for more than half of the natural vegetation. It intergrades with the Big Sagebrush, Creosote Bush, Greasewood, and Mixed Saltbush series. The Shadscale Series is an upland vegetation type dominated by shrubs but occurs in drier sites than the Big Sagebush Series (Vasek and Barbour 1977). The ground layer in the Shadscale Series is sparse (Sawyer and Keeler-Wolf 1995) except in spring, when showy annual wildflowers appear. Shadscale dominates this community. A wide variety of other shrubs are found in this vegetation type in the study area, including (in order of abundance) hop-sage, cheesebush, budsage (*Artemisia spinescens*), white bursage, and winterfat. The Shadscale Series is not homogeneous throughout the study area; some patches contain significant amounts of four-wing saltbush, spiny saltbush, or valley saltbush. These patches are similar to Mixed Saltbush (above) but have not been mapped separately. The Shadscale Series can occur on either poorly drained flats with saline or alkaline soils or on well-drained slopes (Vasek and Barbour 1977, Holland 1986). As discussed in Section 4.1 (NES June 2003), 10 invasive plants occur in the study area, but they are generally not widespread. These invasive species are giant reed (*Arundo donax*), wild oats (*Avena fatua*), five-horn bassia (*Bassia hyssopifolia*), red brome (*Bromus madritensis* ssp. *rubens*), cheat grass (*Bromus tectorum*), Italian ryegrass (*Lolium multiflorum*), black locust (*Robinia pseudoacacia*), Russian thistle (*Salsola tragus*), Mediterranean grass (*Schismus arabicus*), and salt cedar (*Tamarix ramosissima*).

Further descriptions of soils, hydrology and vegetation communities present in the BSA are contained in the Botanical Survey Report (Appendix A) and Jurisdictional Delineation Report (Appendix B).

3.1.3.2. COMMON FAUNA

Owens Valley mammals include species from several different biogeographic regions, including the Great Basin, Mojave Desert, White-Inyo mountains, and Sierra Nevada mountains, as well as species unique to the groundwater-dependent alkali meadows on the valley floor.

The Tule Elk *(Cervus elaphus nannodes*) are the smallest form of elk, and once roamed the Central Valley and Coast Range of California, their main habitat, until being hunted nearly to extinction by 1870. Although they are not native to the Eastern Sierra, Owens Valley's Tule Elk herd originated as a group of 27 elk released into the area around the Tinemaha Reservoir in the 1930s. They had first been relocated to the Yosemite Valley, but were later evicted by the Park Service, as they are not native to Yosemite either.

Mule deer (*Odocoileus hemionus*) overwinter on the alluvial fans at the base of the Sierra Nevada in the west and frequently migrate through the Owens River valley to and from winter range in the volcanic tablelands at the north end of the valley. Mountain lions (*Felis concolor*), occupy the same range. On the east side of the valley, Sierra Nevada bighorn sheep (*Ovis canadensis sierrae)* range from the ridges of the White and Inyo Mountains down to relatively low elevations in stream canyons on the west side of the escarpment.

Several species of bats occupy Owens Valley's, including brown bats (both *Eptesicus fuscus* and *California myotis*) and western pipistrelles (*Pipistrellus hesperus*).

Side-blotched lizard (*Uta stansburiana*), white-tailed antelope ground squirrel, Merriam's kangaroo rat (*Dipodomys merriami*), turkey vulture (*Cathartes aura*), and common raven (*Corvus corax*) can all be found commonly within the project area.

3.1.3.3. DESCRIPTION OF MIGRATION CORRIDORS

The generally north-south orientation of the Owens Valley facilitates the seasonal migration of birds, and likely that of bats.

Historically, Owens Lake was one of the most important stopover sites for migrating waterfowl and shorebirds in the western United States for thousands of years. Owens Lake is a nationally significant Important Bird Area (IBA) as designated by the National Audubon Society. The lake was so designated due to the thousands of shorebirds that migrate through each fall and spring between the Arctic and Central and South America and also because of the large numbers of snowy plovers that nest there. In addition, several thousand snow geese and ducks winter at the lake.

In spring, thousands of migrating shorebirds move north from wintering areas as far south as Argentina (Patagonia) and Tierra del Fuego. These masses of birds migrate through North America to breed in the boreal forests of Alaska and Canada as well as the high Arctic along the Bering Sea and Arctic Ocean. Along the routes, migrants stop at rich feeding sites such as coastal wetlands and estuaries as well as inland lakes in the Great Basin such as Mono Lake, Great Salt Lake, and Owens Lake.

The only known non-flying mammal migration in the area is that of mule deer in the Sierra Nevada, which migrate from high-elevation summer ranges to lower elevation winter. Mule deer (*Odocoileus hemionus*) overwinter on the alluvial fans at the toes of the Sierra Nevada in the west and frequently migrate through the Owens River valley to and from winter range in the volcanic tablelands at the north end of the valley.

3.1.3.4. Description of Aquatic Resources.

Aquatic resources are relatively scarce, because most surface water is captured for export to Los Angeles. Water does flow at least occasionally in some of the creeks, notably Olancha Creek. Large areas of wetlands and springs occur to the east, within the boundaries of Alternative 2R. For further discussion of aquatic resources refer to Jurisdictional Delineation Report (Appendix B).

3.1.3.5. Description of Invasive Species.

Giant reed *(Arundo donax)*, cheat grass, and salt cedar (*Tamarix ramosissima*) are on List A-1, which includes the “Most Invasive Wildland Pest Plants; Widespread.” Red brome (*Bromus madritensis* ssp. *rubens*) is on List A-2, which is defined as “Most Invasive Wildland Pest Plants; Regional.” Two species found in the area, five-horn bassia and black locust, are on the California Exotic Pest Plant Council (CalEPPC) List B, “Wildland Pest Plants of Lesser Invasiveness.” CalEPPC includes Russian thistle (*Salsola tragus*) on a list of species for which more information is needed. Finally, three of the species in the study area, wild oats (*Avena fatua*), Italian ryegrass (*Lolium multiflorum*), and Mediterranean grass (*Schismus arabicus*) are on CalEPPC’s list of annual grasses that pose significant threats to wildlands but do not qualify for Lists A or B. Giant reed, wild oats, Italian ryegrass, and Russian thistle occurred only on the roadside along the existing lanes of Highway 395 and were quite sparse. Cheat grass and Mediterranean grass also were sparse and were observed only along dirt roads. Red brome was found occasionally in a variety of plant communities but did not grow in dense stands during the survey years. Black locust was found at an old homesite and is planted along Highway 395 in Olancha. Five-horn bassia was confined to an alkaline area north of Cartago near Willow Dip. Salt cedar forms a large stand east of Highway 395 south of Olancha and could spread to other riparian areas if left unchecked.

3.2. Regional Species and Habitats of Concern

3.2.1. Fremont Cottonwood Series

Within the BSA for Alternative 4, the Fremont Cottonwood Series occupies approximately 2.4 acres, which is largely located within Olancha Creek. The Fremont Cottonwood Series as described by Sawyer and Keeler is also referred to as Mohave Riparian Association (CNDDB 2002b) and Mohave Riparian Forest (Holland 1986). This series is typically dominated by Fremont cottonwood, a facultative wetland species that grows to approximately 80 feet. This series is typical of riparian areas, where soils are flooded intermittently by fresh water but remain saturated continuously (Sawyer and Keeler-Wolf, 1995). The soils vary from silty alluvial to rocky, sandy, well-drained substrates (Bradley and Deacon, 1967; Cheatham and Haller, 1975). Soils generally are moist, but some are dry at the surface with moisture beginning at a depth of several meters (Cheatham and Haller, 1975).

The Fremont Cottonwood Series occurs primarily along Olancha Creek, which is one of the primary local drainages originating from the Sierra Nevada and flowing through the BSA. This series also occurs in the BSA within an unnamed spring-fed drainage located near the southern terminus, west of the Union Pacific Railroad. In total, the area of this habitat within the BSA is approximately 2.4 acres.

3.2.2. Regional Sensitive Plant Species

Table 3 below addresses sensitive plant species that may occur within the BSA of Alternative 4. The BSR (Appendix A) provided this information and also contains a more detailed account of floristic surveys as well as a complete list of all plants observed during the study.

Table 3: Regional Sensitive Plant Species

Common Name	Scientific Name	Status Federal / State / CNPS	General Habitat Description	Habitat Present/ Absent	Rationale
Ramshaw Measows abronia	Abronia alpina	--/--/1B.1	Meadows and seeps; 2400-2700	A	Meadows and seeps are not present. BSA is outside of the species known elevation range.
Tulare County rock-cress	Arabis pygmaea	--/--/4.3	Meadows and seeps (edges), subalpine coniferous forest, volcanic or granitic, gravelly or sandy soils	A	Meadows and seeps are not present. BSA is outside of the species known elevation range.
Greene's rock-cress	Arabis repanda var. greenei	--/--/--	Subalpine coniferous forest, upper montane coniferous forest with granitic, talus, rocky or sandy soils	A	Suitable habitat is not present. BSA is outside of the known elevation range.
Kern Plateau milk vetch	Astagalus lentiginosus var. kernensis	--/--/1B.2	Meadows and seeps, subalpine coniferous forest with sandy soils	A	Suitable habitat is not present. BSA is outside of the species known elevation range.

Common Name	Scientific Name	Status Federal / State / CNPS	General Habitat Description	Habitat Present/ Absent	Rationale
Kern County milk vetch	Astragalus subvestitus	--/--/4.3	Great Basin scrub, meadows and seeps, pinyon and juniper woodland with gravelly or sandy soils.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.
Beautiful pussy toes	Atennaria pulchella	--/--/4.3	Alpine boulder and rock field (stream margins), meadows and seeps	A	Suitable habitat is not present. BSA is outside of the species known elevation range.
Upswept moonwort	Botrychium ascendens	--/--/2.3	Lower montane coniferous forest, meadows and seeps.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.
Scalloped moonwort	Botrychium crenulatum	--/--/2.2	Bogs and fens, lower montane coniferous forest, meadows and seeps, freshwater marshes and swamps, upper montane coniferous forest.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.
Common moonwort	Botrychium lunaria	--/--/2.3	Meadows and seeps, subalpine coniferous forest, upper montane coniferous forest.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
		Federal / State / CNPS			
Mingan moonwort	Botrychium minganense	--/--/2.2	Bogs and fens, lower montane coniferous forest, upper montane coniferous forest in mesic soils.	A	Suitable habitat is not present. BSA is outside of the known elevation range.
White pygmy-poppy	Canbya candida	--/--/4.2	Joshua tree "woodland", Mojavean desert scrub, pinyon and juniper woodland with gravelly, sandy, granitic soils.	P	Potential habitat (desert scrub) is present within the BSA. Species was not observed during appropriately timed floristic surveys.
Kern Canyon clarkia	Clarkia xantiana ssp. parviflora	--/--/4.2	Chaparral, cismontane woodland, Great Basin scrub, valley and foothill grassland with often sandy sometimes rocky, slopes, roadsides.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.
Kern Plateau bird's-beak	Cordylanthus eremicus ssp. kernensis	--/--/1B.3	Great Basin scrub, Joshua tree "woodland", pinyon and juniper woodland, upper montane coniferous forest.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
		Federal / State / CNPS			
Ripley's cymopterus	Cymopterus ripleyi var. saniculoides	--/--/1B.2	Joshua tree "woodland", Mojavean desert scrub with gravelly, sandy, and carbonate soils.	P	Potential habitat (desert scrub) is present within the BSA. Species was not observed during appropriately timed floristic surveys.
Olancha Peak buckwheat	Eriogonum wrightii var. olanchense	--/--/1B.3	Alpine boulder and rock field, subalpine coniferous forest with gravelly or rocky soils.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.
Sharsmith's stickseed	Hackelia sharsmithii	--/--/2.3	Alpine boulder and rock field, subalpine coniferous forest, granitic, rocky soils.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.
Field ivesia	Ivesia campestris	--/--/1B.2	Meadows and seeps (edges), subalpine coniferous forest, upper montane coniferous forest.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.
Father Crowley's lupine	Lupinus padre-crowleyi	--/--/1B.2	Great Basin scrub, riparian forest, riparian scrub, upper montane coniferous forest with decomposed granitic soils.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
		Federal / State / CNPS			
Creamy blazing star	Mentzelia tridentate	--/--/1B.3	Mojavean desert scrub with rocky, gravelly, sandy soils.	P	Suitable habitat (desert scrub) is present within the BSA. Species was not observed during appropriately timed floristic surveys.
Sweet-smelling monardella	Monardella beneolens	--/--/1B.3	Alpine boulder and rock field, subalpine coniferous forest, upper montane coniferous forest.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.
Tehachapi monardella	Monardella linoides ssp. oblonga	--/--/1B.3	Lower montane coniferous forest, pinyon and juniper woodland, upper montane coniferous forest.	A	Suitable habitat is not present within the BSA.
Crowned muilla	Muilla coronata	--/--/4	Joshua tree woodland, Mohavean desert scrub, and pinyon-juniper woodland.	P	Habitat is present and species was located within the BSA during floristic surveys.
Charlotte’s phacelia	Phacelia nashiana	--/--/1B.2	Joshua tree “woodland”, Mojavean desert scrub, pinyon and juniper woodland, usually granitic, sandy soils.	P	Suitable habitat (desert scrub) is present within the BSA. Species was not observed during appropriately timed floristic

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
		Federal / State / CNPS			
					surveys.
Parish's popcorn flower	Plagiobothrys parishii	--/--/1B.1	Great Basin scrub, Joshua tree "woodland" alkaline, mesic soils.	A	Suitable habitat (alkaline soils) is not present within the BSA.
Letterman's blue grass	Poa lettermanii	--/--/2.3	Alpine boulder and rock field, usually sandy or rocky soils.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.
Tundra thread moss	Pohlia tundrae	--/--/2.3	Alpine boulder and rock field, usually gravelly, damp soil.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.
Owens Valley checkerbloom	Sidalcea covillei	--/SE/1B.1	Chenopod scrub, meadows and seeps, usually alkaline, mesic soils.	A	Suitable habitat (alkaline soils) is not present within the BSA.
Alkali cordgrass	Spartina gracilis	--/--/4.2	Marshes, meadows, usually in wetlands, but occasionally in non-wetlands.	A	Suitable habitat is not present within the BSA.
Dedecker's clover	Trifolium macilentum var. dedeckerae	--/--/1B.3	Lower montane coniferous forest, pinyon and juniper woodland, subalpine coniferous forest, upper montane coniferous forest, usually granitic, rocky soils.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
		Federal / State / CNPS			
Marsh arrow-grass	Triglochin palustris	--/--/2.3	Meadows and seeps, marshes and swamps freshwater, subalpine coniferous forest mesic soils.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.
Grey-leaved violet	Viola pinetorum ssp. grisea	--/--/1B.3	Meadows and seeps, subalpine coniferous forest, upper montane coniferous forest.	A	Suitable habitat is not present. BSA is outside of the species known elevation range.

Codes:
Federal: FE – endangered, FT – threatened;
State: SE – endangered, ST – threatened, SR – Rare;
CNPS: 1B – rare, threatened, or endangered in California and elsewhere
2 – rare, threatened, or endangered in California but more common elsewhere
4 – a watch list, species are of limited distribution or infrequent
.1 – seriously endangered in California
.2 – fairly endangered in California
.3 – not very endangered in California

3.2.3. Regional Sensitive Wildlife Species

Sensitive wildlife species with the potential to occur in the BSA were identified in the original NES (June 2003). Table 4 contains species whose potential impacts may have changed as a result of the new Alternative 4 or were not addressed in the original NES. Refer to the original NES for a complete listing of sensitive wildlife species with potential to occur within the BSA. A complete list of wildlife species observed throughout the project vicinity is also included in Appendix D of the original NES.

Table 4: Regional Sensitive Wildlife Species

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Sierra Nevada bighorn sheep	*Ovis Canadensis californiana*	SE/FE	Alpine to Great Basin sagebrush scrub with visual openness and close proximity to steep rocky terrain	HP	Suitable habitat exists to the west/northwest of the BSA. Sheep may use drainages in BSA. Designated critical habitat exists in the vicinity of the proposed project but will not be impacted. **May Affect-Not Likely to Adversely Affect**
Owens tui chub	*Gila bicolor snyderi*	SE/FE	Streams, spring-fed ponds	HP	The only known population is isolated in two private ponds with no connection to any streams within the BSA and will not be affected by the proposed project. **No Effect.**
Owens pupfish	*Cyprinodon radiosus*	SE/FE	Streams, clear ponds	HP	This species has been extirpated from the area. **No Effect.**
Desert tortoise	*Gopherus agassizii*	ST/FT	Creosote scrub and other desert scrub	P	Habitat is present throughout the BSA. Sign and individual sightings have occurred. **May Affect-Likely to Adversely Affect.**
Least bell's vireo	*Vireo bellii pursillus*	SE/FE	Riparian forests and willow scrub	HP	Potential habitat exists within BSA at Olancha Creek crossing. **May Affect-Not Likely to Adversely Affect**
Swainson's hawk	*Buteo swainsoni*	ST	Nests in trees in open habitat	HP	Potential nest sites occur within project vicinity. **May Affect-Not Likely to Adversely Affect**
Mohave ground squirrel	*Spermophilus mohavensis*	ST	Mohave desert scrub	P	Results from trapping indicated presence on southern portion of BSA. **May Affect-Likely to Adversely Affect**
Western snowy plover	*Charadrius alexandrinus nivosus*	FT	Sandy beaches, salt pond levees, shores of large alkali lakes	HP	Potential habitat exists along the western edge of Owens Lake, however this area will not be impacted by the proposed project. **No Effect.**

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
California wolverine	*Gulo gulo*	ST	North coast mountains and the Sierra Nevada; wide variety of high elevation habitats	A	Suitable habitat is not present within BSA. **No Effect.**
Yellow warbler	*Dendroica petechia*	SSC	Willow and cottonwood riparian	HP	Potential habitat exists within BSA at Olancha Creek crossing.
Mule deer	*Odocoileus hemionus*		Wide ranging typically high elevation (5000-10000) in summer; and low in winter.	P	CDFG has identified the Monache deer herd to utilize habitat within the proposed project area.

Codes:
FT – Federally Threatened, FE – Federally Endangered
ST – State Threatened, SE – State Endangered, SSC – State Species of Concern
HP – Habitat is or may be present. Species may be present, P – Species is present

Chapter 4. Results: Biological Resources, Discussion of Impacts and Mitigation

4.1. Natural Communities of Special Concern

4.1.1. Discussion of Wetlands

All areas within the BSA that were suspected of having wetland characteristics were delineated according to the guidelines of the online editions of the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation manual: Arid West Region* (USACE 2008) and the *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008). Please refer to *Jurisdictional Delineation Report for the Olancha/Cartago 4-Lane Project* (July 2009) (Appendix B) for additional discussions of wetlands, survey results, data sheets and mapping.

The proposed project may impact jurisdictional wetlands and/or other waters of the U.S. A jurisdictional delineation was submitted to the USACE on December 3, 2009 for verification of wetlands and other waters of the U.S.

4.1.1.1. Survey Results

There are 30.22 acres of Waters of the U.S (WOUS) in the Study Area. Of this total, 28.17 acres are wetlands (WL) and 2.05 acres are other waters of the U.S (OWUS) or culverted waters of the US (CWUS). There are 4.28 acres of non-jurisdictional waters in the Study Area. In the *Jurisdictional Delineation Report for the Olancha/Cartago 4-Lane Project* (July 2009) Figure 4 provides a large, single-sheet display of the features mapped in the Study Area.

Three wetland areas were identified during the jurisdictional determination and are depicted and mapped in the delineation report as Wetlands 1, 2 and 3. Wetland 3 is the largest (24.71 acres) of these three areas and would have been heavily impacted by choosing Alternative 2R.

4.1.1.2. AVOIDANCE AND MINIMIZATION MEASURES

During the development and evaluation of project alternatives it was discovered that Alternative 2R would cause prohibitive impacts to wetlands and as such was dropped from further consideration.

Using protective wetland mats or performing work outside of the rainy season would minimize temporary impacts to wetlands or OWUS. Temporary impacts would be restored to pre-project conditions.

Any wetlands that are not in the direct path of construction will be avoided by designating them as ESAs.

4.1.1.3. PROJECT IMPACTS

Table 4 below provides an acreage summary of impacts for each proposed alternative, including Alternative 2R that was dropped from further consideration due to the level of impacts to wetlands.

Table 5: Impacts to Wetlands and Waters of the U.S.

Alternative	Impacts (acres)	
	WOUS	Wetland
1	0.66	0.53
2	0.63	0.53
2A	0.26	0.53
2R	0.71	25.24
3	0.69	0.53
4	1.49	0.53

4.1.1.4. COMPENSATORY MITIGATION

Compensatory mitigation for impacts to wetlands is being proposed at a 1:1 ratio to ensure no net loss of wetland habitat and would be completed through the in-lieu fee process or by purchasing credits from a USACE approved mitigation bank.

4.2. Special Status Plant Species

4.2.1. Discussion of Crowned Muilla

Within the BSA for Alternative 4, crowned muilla is the only sensitive plant species identified. For further discussion regarding Crowned muilla including survey results and a complete list of vascular plants identified within the BSA please refer to the *Botanical Survey Report* (October 2008) in Appendix A.

4.2.1.1. Avoidance and Minimization Measures

Crowned muilla is a CNPS List 4 species. List 4 species do not meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the Fish and Game Code, and few, if any, are eligible for state listing. Nevertheless, many of them are significant locally, and the CNPS strongly recommends that List 4 plants be evaluated for consideration during preparation of environmental documents relating to CEQA. As part of the minimization measures Caltrans intends to collect duff and soil to a depth of six inches, and then redistribute the material within the study area. This action should be sufficient to mitigate impacts to crowned muilla.

4.2.1.2. Project Impacts

Ground disturbing activities conducted as part of the proposed project may affect crowned muilla, however given the minimization measures and listing status of this plant those effects are expected to be minimal and would not threaten the future of this plant in the project area.

4.2.1.3. Compensatory Mitigation

No compensatory mitigation is proposed for this species.

4.2.1.4. Cumulative Effects

The actions from the proposed project or reasonably foreseeable projects in the area (Hwy 395 in Inyo County) are not expected to threaten crowned muilla or trend toward listing.

4.3. Special Status Animal Species Occurrences

4.3.1. Discussion of Desert Tortoise

The desert tortoise is a large, herbivorous reptile that lives throughout the Mojave and Colorado deserts from below sea level to 4,130 feet or higher. Desert tortoises are found in creosote bush scrub, saltbush scrub, and Joshua tree woodland. Tortoises are most active during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rainstorms. Desert tortoises spend the remainder of the year in burrows, escaping extreme conditions of the desert. This species is undergoing a decline due to off-highway vehicle use, competition with livestock, disease, predation, deliberate killing, and general forms of harassment, such as collection. This species is also experiencing the loss and degradation of its habitat.

In 2003, the USFWS agreed to modify the survey protocol for desert tortoise by only surveying the biological study area and not conducting a “zone of influence” survey. This change was approved as long as evidence of a tortoise was observed within the biological study area.

4.3.1.1. Survey Results

On five separate occasions, during the months of April and May 2008, individual tortoises and dens were observed and locations were recorded by Caltrans District 9 project team members. During wetland/waters delineation surveys, a contract biologist reported observing a desert tortoise at approximately one mile south of the northernmost edge of the project limits.

4.3.1.2. Avoidance and Minimization Measures

Before any construction activity starts, the contractor awarded the proposed project shall furnish a qualified biologist, who will be responsible for overseeing compliance with Contract Special Provisions as stated below. The following will be included in the Contract Special Provision for protection of desert tortoise throughout the project:

- The qualified biologist(s) shall be responsible to see that all persons employed on the construction project shall receive instruction regarding the desert tortoise prior to performing on-site work. Instruction shall include the importance of the desert tortoise to the environment, recovery efforts for the desert tortoise, implications of the Endangered Species Act, and the importance of following all terms and conditions provided in the biological opinion. Employees shall be notified that they are not authorized to handle or otherwise move desert tortoises encountered on the project site. An education program that has been previously approved by the USFWS may be used to satisfy this term and condition, provided the project-specific mitigation measures are fully discussed.

- Only biologists authorized by the USFWS and CDFG shall handle desert tortoises.
- No construction activities shall begin until an authorized biologist is approved.
- The authorized desert tortoise biologist shall monitor installation of the temporary fence. Two types of material can be used to construct the temporary fence: 1) Plastic diamond mesh, install a minimum of 18 inches above ground and fold the bottom of the mesh toward the habitat side of the barrier and away from the highway then backfill: 2) Install temporary linear sediment barrier (Type silt fence), minimum 18 inches above ground and bury material minimum 6 inches below ground. After installation, the qualified biologist(s) shall conduct 100% coverage clearance surveys and regularly inspect the fence to ensure its integrity. Any repairs to the fence shall be made immediately. The entire project area shall be surveyed for desert tortoises by the authorized biologist after installation of the fence and within seven days prior to the start of any further construction activities.
- Desert tortoise burrows within the project limits shall be excavated by hand either by or under the direct supervision of the authorized biologist, and collapsed to prevent reentry.
- All desert tortoises found shall be removed from within the fenced area or placed outside of the construction corridor. If the removal is during the season of aboveground activity, the desert tortoises shall be placed beside a nearby burrow of appropriate size. If the removal is not in the season of aboveground activity, the desert tortoise shall be moved (dug out of burrow, if necessary) on a seasonably warm day and placed at the mouth of a nearby burrow of appropriate size. If the desert tortoise does not enter the burrow, an artificial burrow may be constructed and the desert tortoise placed within it. The authorized biologist shall be allowed some judgment and discretion to ensure that survival of the desert tortoise is likely.
- If desert tortoises are encountered above ground during construction, the desert tortoise shall be moved out of the construction corridor, placed under a shrub in the direction it was traveling. In general, desert tortoises should be moved the minimum distance possible to ensure their safety. If desert tortoises need to be moved at a time of the day when ambient temperatures could harm them (i.e. extremely low [less than 40^{o}F] or high [greater than 90^{o}F] temperatures), they

shall be held overnight in a clean cardboard box. These desert tortoises shall be kept in the care of the authorized biologist under appropriate controlled temperatures and released the next day when temperatures are favorable. All cardboard boxes shall be properly discarded after one use.

- The authorized biologist(s) shall follow the *Guidelines for Handling Desert Tortoises During Construction Projects* (Desert Tortoise Council 1994 - revised 1999).
- If it is necessary for a worker to park temporarily outside of the fenced enclosures, the worker shall inspect for desert tortoises under the vehicle prior to moving it. If a desert tortoise is present, the worker shall carefully move the vehicle only when necessary and when the desert tortoise would not be injured by moving the vehicle or shall wait for the desert tortoise to move out from under the vehicle. The authorized biologist may also be contacted to remove the desert tortoise. The authorized biologist shall maintain a record of all desert tortoises handled. This information shall include for each desert tortoise:

1. The locations (narrative and maps) and dates of observations,
2. General condition and health, including signs of diseases, injuries and state healing, and whether animals voided their bladders,
3. Location moved from and location moved to,
4. Diagnostic markings (e.g., identification numbers or marked lateral scutes), and
5. Slide photograph of each handled desert tortoise

4.3.1.3. CRITICAL HABITAT

The USFWS designated critical habitat for the desert tortoise in 1994 (59 FR 5820 5866). The closest desert tortoise critical habitat to the proposed project is more than 100 km (60mi) to the south.

4.3.1.4. PROJECT IMPACTS

The proposed project will permanently remove 296 acres of habitat for the desert tortoise. Potential mortality or injury to desert tortoise may occur from construction related activities such as vehicle movement, and excavations. Any individual tortoises located within the project footprint or trapped within areas of construction will need to be relocated. Implementing avoidance and minimization measures should reduce the potential to harm or kill a desert tortoise as a result of construction activities.

4.3.1.5. Compensatory Mitigation

To compensate for the loss of desert tortoise habitat Caltrans proposes to mitigate at a 3:1 ratio for impacted habitat and will preserve in perpetuity 888 acres of desert tortoise habitat.

4.3.1.6. Cumulative Effects

Although the proposed project will permanently remove habitat for the desert tortoise, avoidance and minimization measures in combination with compensatory mitigation are expected to reduce impacts to a level that would not adversely contribute to the continued existence of this species or produce a measurable cumulative effect.

4.3.2. Discussion of Least Bell's Vireo

Least Bell's vireo is a small songbird that was once widespread in low-elevation riparian areas of the state. Its preferred habitat is willow riparian woodland. It is present in California only during the breeding season. The loss of riparian habitat and nest parasitism by the brown-headed cowbird (*Molothrus ater*) has drastically reduced the numbers and range of least Bell's vireo. Bell's vireo has historically nested in the Olancha area, but it is unclear if it was the Least Bell's vireo subspecies (Bagley and Leatherman 1999). There is marginal riparian willow habitat in the Olancha Creek area.

4.3.2.1. Avoidance and Minimization Measures

Prior to project implementation surveys will be performed according to guidelines set by the USFWS (2001) to accurately determine presence or absence. Special provisions will also be included in the construction contract to protect all migratory birds including least Bell's vireo. Riparian areas will be restored and revegetated to pre-project conditions following project completion.

4.3.2.2. Project Impacts

The proposed project may remove potential nesting habitat at Olancha Creek.

4.3.2.3. Compensatory Mitigation

Riparian areas affected by the proposed project will be restored and revegetated at a 3:1 ratio.

4.3.2.4. Cumulative Effects

Because it is unknown whether there is least Bell's vireo present within the project vicinity it is difficult to determine any potential cumulative effects at this time.

4.3.3. Discussion of Swainson's Hawk

Swainson's hawks breed in the Central Valley and Owens Valley, often nesting in trees adjacent to agricultural fields or pastures. They forage over open shrub lands, alfalfa fields, and pastures. They are present in California only for nesting, and they winter in South America.

4.3.3.1. Survey Results

No Swainson's hawks were observed during the focused surveys or during any other fieldwork on this project. Stick nest sites were frequently observed, but no Swainson's hawks were seen on or near them.

The original NES (June 2003) contains correspondence dated 17 May 2001 to R. Schlorff of CDFG, Karyn Sernka, who has conducted surveys for Swainson's hawks in the area for several years, reported seeing no Swainson's hawks in a historically occupied territory at the southeastern part of the study area off Cactus Flat Road in May of 2001. She related that the last time the territory was occupied was in 1999, when the nest failed. This may be the same nest reported in Bagley and Leatherman (1999). In a draft report, Sernka (no date) presented results of a Swainson's hawk survey in the Owens Valley in 1998 in which no Swainson's hawk nests were found south of Big Pine, some 40 miles north of the study area. In an email to T. Kucera dated 29 July 2002, Ms. Sernka reported that in the spring of 2002 there was a nesting pair of Swainson's hawks off Cactus Flat Road in one of the windbreak trees on the west side of an alfalfa field**.** An active Swainson's hawk nest was not found in Olancha in 2001.

4.3.3.2. Avoidance and Minimization Measures

Alternatives will avoid removal of trees whenever possible. Removal of any trees will be done during the non-nesting season (September-February). Preconstruction surveys will be conducted no more than 30 days prior to starting construction. If nesting Swainson's hawks are present within one-quarter mile of the proposed project site, the California Department of Fish and Game will be notified and a work window may be implemented. A qualified biologist will monitor all nests during construction.

4.3.3.3. Project Impacts

Removal of potential nest trees may reduce nesting opportunities for Swainson's hawks.

4.3.3.4. COMPENSATORY MITIGATION

Any trees removed will be replaced at a 2:1 ratio. Plantings will occur as close to the project area as possible.

4.3.3.5. CUMULATIVE EFFECTS

There may be a temporal loss of potential nesting sites for Swainson’s hawks although replanting any trees removed should minimize this affect. Based on avoidance and minimization measures it is not expected that the proposed project will contribute to a cumulative effect on Swainson’s hawk.

4.3.4. Discussion of Mohave Ground Squirrel

The Mohave ground squirrel is a small squirrel with a total length of 9 inches. It is uniformly grayish-brown above and lighter on its underside with a distinctive white eye ring. It eats a variety of green vegetation, seeds, and fruits and forages on the ground or in shrubs and Joshua trees (DFG 1990). This squirrel utilizes a variety of habitat types within several vegetation communities dominated by creosote, shadscale, or Joshua tree.

It occurs in the Western Mojave Desert from southwestern Inyo County, south through eastern Kern County, northeastern San Bernardino County and northeastern Los Angeles County. It has one of the smallest geographic ranges of the 28 species of ground squirrel (Hall, 1981). Within the range there have been four core areas supporting widespread populations that have been identified by Mohave ground squirrel researchers (Leitner, 2005). The Project bisects one of these core areas.

4.3.4.1. AVOIDANCE AND MINIMIZATION MEASURES

An environmental awareness program would be conducted to inform all construction related personnel about the need to minimize impacts to only those necessary for construction in order to reduce impacts to Mohave ground squirrels.

Measures will be contained within the contract special provisions that require work to be stopped in the event a squirrel is located or injured as part of the construction activities. Work will not resume until an authorized biologist has relocated the squirrel or allowed it to disperse on its own. If occupied burrows are found within construction limits, CDFG will be consulted and a method for trapping and relocating the squirrels will be devised.

4.3.4.2. Project Impacts

Direct effects to Mohave ground squirrel are expected from direct loss of habitat. There also exists a potential impact from construction related activities that may result in squirrel injury or mortality.

4.3.4.3. Compensatory Mitigation

Caltrans will compensate for direct impacts to Mohave ground squirrel habitat loss by preserving habitat essential for the squirrels survival at a 3:1 ratio and at a location approved by CDFG.

4.3.4.4. Cumulative Effects

In the study area there are no other known projects or proposed projects in the reasonably foreseeable future that are likely to affect the Mohave ground squirrel or adversely contribute to the species continued existence.

4.3.5. Discussion of Sierra Nevada Bighorn Sheep

Sierra Nevada bighorn sheep are ungulates that utilize a wide range of elevations, from alpine peaks (13,120 feet) to the base of the eastern escarpment as low as 4,760 feet. In September 2007, the Final Recovery Plan for the Sierra Nevada Bighorn Sheep was released. Since, there has been Critical Habitat designated by the USFWS. Alternative 4 (as proposed) runs parallel to the critical habitat designated by the USFWS approximately 1300 feet from the edge. All other alternatives completely avoid all potential contact with any of the herd units in the Olancha/Cartago area.

4.3.5.1. Avoidance and Minimization Measures

If Alternative 4 becomes the preferred alternative, the following avoidance and minimization measures will be implemented to ensure no harm come to any Sierra Nevada bighorn sheep:

- The qualified biologist(s) shall be responsible to see that all persons employed on the construction project shall receive instruction regarding the Sierra Nevada bighorn sheep to performing on-site work. Instruction shall include the importance of the Sierra Nevada bighorn sheep to the environment, recovery efforts for the Sierra Nevada bighorn sheep, implications of the Endangered Species Act, and the importance of following all terms and conditions provided in the biological opinion. An education program that has been previously approved by the USFWS may be used to satisfy this term and condition, provided the project-specific mitigation measures are fully discussed.

- Wrappers, food scraps, cans, bottles, etc. must be disposed of in a closed trash container or removed from the site.
- Do not travel or place materials or equipment outside the designated construction areas.
- Do not touch, harass, collect, or otherwise harm Sierra Nevada bighorn sheep.
- If, during construction, the contractor discovers a Sierra Nevada bighorn sheep, the Contractor shall protect it and immediately notify the Engineer. Work shall be stopped in the immediate area until the sheep leaves on its own, or can be safely discouraged from the area by an approved biologist.
- If, during construction a Sierra Nevada bighorn sheep is harmed or killed, the Contractor shall immediately notify the Engineer. Work shall be stopped in the immediate area until the approved biologist can remove the injured or Sierra Nevada bighorn sheep.
- Caltrans shall submit the names(s) of the proposed authorized biologist(s) to the Service for review and approval at least 15 days prior to the onset of activities. No construction activities shall begin until an authorized biologist is approved.

4.3.5.2. CRITICAL HABITAT

Critical habitat for the Sierra Nevada bighorn sheep was designated by the USFWS in September 2008 (50 CFR Part 17) and includes approximately 417,577 acres, which fall within the boundaries of the critical habitat designation. The critical habitat is located in Tuolumne, Mono, Fresno, Inyo, and Tulare Counties, California. The closest area of critical habitat to the proposed project location is Herd Unit 12, the Olancha Peak Herd Unit. South of Cottonwood Creek, from north to south, are Ash, Braley, Cartago, Olancha, and Falls Creeks, all of which are potential bighorn sheep habitat. The southern three of these creeks are more favorable because they readily connect to Olancha Peak, which reaches 12,123 feet and provides some alpine summer habitat (the southernmost alpine habitat in the Sierra Nevada). Olancha Canyon is the most direct connection to this alpine habitat. The Olancha Peak herd would be the most southern herd in this recovery unit. Winter range would be traditional low elevation south-facing slopes, of which there is an abundance of excellent habitat reaching low elevations that will ensure high winter and spring diet qualities (Recovery Plan for the Sierra Nevada Bighorn Sheep, September 2007).

4.3.5.3. Project Impacts

Alternative 4 comes approximately 1,300 feet from the eastern edge of the Herd Unit 12 critical habitat designation. Impacts to bighorn sheep may occur from the proposed project by disruption of migration from higher to lower elevations in the project vicinity due to construction activities. Construction activities at drainage crossings may also impact bighorn sheep by discouraging the sheep from utilizing these areas during construction. Noise from construction related activities may also impact bighorn sheep by disrupting natural travel routes.

Implementing the avoidance and minimization measures mentioned above should reduce the potential for impacts to this species.

4.3.5.4. Compensatory Mitigation

No compensatory mitigation is proposed.

4.3.5.5. Cumulative Effects

There will be no direct effects to Critical Habitat for Sierra Nevada bighorn sheep and based on avoidance and minimization measures implemented during construction it is not anticipated that any direct effects to bighorn sheep will adversely contribute to the survival of this species or cause a negative cumulative effect.

4.3.6. Discussion of Mule Deer

The mule deer (*Odocoileus hemionus*) is the largest of the *Odocoileus* genus, standing, on the average, 40 to 42 inches at the shoulders and stretching 80 inches or so nose to tail. An adult buck will weigh from 150 to 300 pounds on the hoof, with does averaging 100 to 175 pounds.

The California Department of Fish and Game has identified the Monache Herd using the habitat within the proposed project area. There are six recognized subspecies of mule deer in California, occurring in about half of the state. The Monache Herd is made up of the Inyo Mule Deer (*Odocoileus hemionus inyoensis*). Alternative 4 contains habitat used as the deers wintering range, and is a vital area for sucessful migration yearly. The unit has been named “Zone X-10” , which have fewer hunting tags issued each year, and the bucks tend to be larger trophy quality deer.

4.3.6.1. Avoidance and Minimization Measures

Alternative 4 if chosen will incorporate at least two wildlife crossings to minimize impacts to the migration of deer.

4.3.6.2. PROJECT IMPACTS

Alternative 4 would have the greatest impacts to the winter migration corridor of the deer herds. A minimum of two (2) wildlife crossings is necessary to minimize the impacts to the migration of these deer. The proposed new alignment of Alternative 4 may cause an increase in the potential for vehicle related mortalities as well as a disruption of natural migration routes, however the wildlife crossings should offset that potential and provide a safe alternative for the herd.

4.3.6.3. CUMULATIVE EFFECTS

Given the minimization measures and proposed wildlife crossings the cumulative effects from the proposed project or any reasonably foreseeable projects in the future are not anticipated to adversely contribute to the species existence.

4.3.7. Discussion of Yellow Warbler

The yellow warbler is a small songbird that was once a common migrant breeder throughout California. While its range did not extend throughout the Mohave Desert it was found in the Panamint and Grapevine Mountains as well as the Mohave River (Grinnel and Miller 1944). Yellow warblers generally prefer riparian vegetation, primarily willow and cottonwoods, in close proximity to water along streams and in wet meadows. It is typically present in California only during the breeding season. The loss of riparian habitat and nest parasitism by the brown-headed cowbird has drastically reduced the numbers and range of yellow warblers. Yellow warblers occur very locally in low densities on the Owens Valley floor, Inyo County (Shuford, W. D., and Gardali, T. 2008) There is marginal riparian willow habitat in the Olancha Creek area.

4.3.7.1. AVOIDANCE AND MINIMIZATION MEASURES

Prior to project implementation surveys will be performed to accurately determine presence or absence. Special provisions will also be included in the construction contract to protect all migratory birds including yellow warblers. Riparian areas will be restored and revegetated to pre-project conditions following project completion.

4.3.7.2. PROJECT IMPACTS

The proposed project may remove potential nesting habitat at Olancha Creek.

4.3.7.3. CUMULATIVE EFFECTS

Because it is unknown whether there is yellow warbler's present within the project vicinity it is difficult to determine any potential cumulative effects at this time

Table 6 clarifies effects determinations for threatened and endangered species.

Table 6: Effects Determination for Threatened and Endangered Species

Species Common Name	Scientific Name	Status	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 4	No Build
Swainson's hawk	*Buteo swainsoni*	ST	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	No Effect
Western snowy plover	*Charadrius alexandrinus nivosus*	FE	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Owens pupfish	*Cyprinodon radiosus*	FE, SE	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Owens tui chub	*Gila bicolor snyderi*	FE, SE	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect

Species Common Name	Scientific Name	Status	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 4	No Build
Desert tortoise	*Gopherus agassizii*	FT, ST	May Affect-Likely to Adversely Affect	May Affect-Likely to Adversely Affect	May Affect-Likely to Adversely Affect	May Affect-Likely to Adversely Affect	May Affect-Likely to Adversely Affect	No Effect
California wolverine	*Gulo gulo*	ST	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Sierra Nevada bighorn sheep	*Ovis Canadensis sierrae*	FE, SE	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	No Effect
Owens Valley checkerbloom	*Sidalcea covillei*	SE	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	No Effect

Species Common Name	Scientific Name	Status	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 4	No Build
Least Bell's vireo	*Vireo bellii pusillus*	FE, SE	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	May Affect-Not Likely to Adversely Affect	No Effect
Mohave ground squirrel	*Xerospermophilus mohavensis*	ST	May Affect-Likely to Adversely Affect	May Affect-Likely to Adversely Affect	May Affect-Likely to Adversely Affect	May Affect-Likely to Adversely Affect	May Affect-Likely to Adversely Affect	No Effect

Key:

FT-Federally Threatened; FE-Federally Endangered
ST-State Threatened; SE-State Endangered

Chapter 5. Results: Permits and Technical Studies for Special Laws or Conditions

5.1. Federal Endangered Species Act Consultation Summary

An official response to a request for threatened and endangered species list which may be present near the proposed project was received by Caltrans on June 18, 2002. In this response, Diane K. Noda, Field Supervisor with the USFWS in Ventura, California, wrote "The federally endangered least Bell's vireo (*Vireo bellii pusillis*), Owen's tui chub (*Gila bicolor snyderi*), and the Owen's pupfish (*Cyprinodon radiosus*) are the only federally listed species known to occur in the area."

5.2. California Endangered Species Act Consultation Summary

Informal consultation was held with CDFG personnel Darryl Wong, Denyse Racine, and Adrienne Disbrow of Bishop and John Gustafson and Ronald Schlorff of Sacramento. These discussions included ratios for mitigation for Mohave ground squirrel, Swainsons's hawk sightings and potential nest locations as well as survey protocol for desert tortoise.

5.3. Wetlands and Other Waters Coordination Summary

A wetland delineation titled: *Jurisdictional Delineation Report for the Olancha/Cartago 4-Lane Project* (July 2009) was conducted from April 28 to May 6, 2009 and submitted to the USACE on December 3, 2009 for verification of wetlands and other waters of the U.S. Please refer to this report for further discussions of wetlands/WOUS (Appendix B).

5.4. Invasive Species

Executive Order 13112 (3 February 1999) calls for Executive Branch agencies to work to prevent the introduction and control the spread of invasive species, and eliminate or minimize their associated economic, ecological, and human health impacts. To prevent the introduction and spread of invasive species, the Department of Transportation has issued policy guidelines, which provide a framework for addressing roadside vegetation management issues for construction activities and maintenance programs. These measures may include the inspection and cleaning of construction equipment, commitments to ensure the use of invasive-free mulches, topsoils and seek mixes, and eradication strategies to be deployed should an invasion occur. There are a number of invasive species present in the project impact area including Giant reed (*Arundo donax*), wild oats (*Avena fatua),* Italian ryegrass (*Lolium perenne),* and Russian thistle (*Salsola tragus*). All of these species establish themselves in disturbed areas and may subsequently spread into undisturbed neighboring habitats.

None of the non-native, potentially invasive plants appeared to be widespread in the study area during surveys. However, the annual plants could possibly be more widespread and more invasive in wetter years. Giant reed, wild oats, Italian ryegrass, and Russian thistle occurred only on the roadside along the existing lanes of U.S. 395 and were quite sparse. Except for Russian thistle, these species must be recent introductions because DeDecker (1974) did not list them as present in the Owens Valley.

Caltrans will implement special provisions in the construction contract to prevent the further spread of invasive species in the project area.

5.5. Other

Through coordination with CDFG Alternative 4 will incorporate at least 2 multi-modal crossings, which will offset impacts to the Monache deer herd as well as allow utilization by recreationists and cattle.

Chapter 6. References

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Appendix A Botanical Survey Report

Appendix B Jurisdictional Delineation Report for the Olancha/Cartago 4-Lane Project

Appendix C Threatened and Endangered Species List

Appendix F. Agency Consultation and Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

In Reply, refer to: 2002-TSP-403.1

June 18, 2002

Wendy Philpott
District 9
Department of Transportation
500 South Main Street
Bishop, California 93514-3423

Subject: Species List for a Proposed Project on Highway 395 between Post Mile 30 and 42, Inyo County, California

Dear Ms. Philpott:

This letter is in response to your request, dated January 30, 2002, for information on threatened and endangered species which may be present on or near the proposed project on Highway 395 between Post Mile 30 and 42, Inyo County, California. The federally endangered least Bell's vireo (*Vireo bellii pusillus*), Owen's tui chub (*Gila bicolor snyderi*), and the Owen's pupfish (*Cyprinodon radiosus*) are the only federally listed species known to occur in this area. The only record for the least Bell's vireo is from the 1891 Death Valley expedition, noted in the California Natural Diversity Data Base occurrence data for Owen's Valley. This response fulfills the requirements of the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act of 1973, as amended (Act).

The Federal Highway Administration (FHWA), as the lead federal agency for the proposed action, has the responsibility to review its proposed activities and determine whether any listed species may be affected. If the proposed action requires the preparation of an environmental impact statement, the FHWA has the responsibility to prepare a biological assessment to make a determination of the effects of the action on the listed species. If the FHWA determines that a listed species is likely to be adversely affected, it should request, in writing through our office, formal consultation pursuant to section 7 of the Act. Informal consultation may be used to exchange information and resolve conflicts with respect to threatened or endangered species prior to a written request for formal consultation. During this review process, the FHWA may engage in planning efforts but may not make any irreversible commitment of resources. Such a commitment could constitute a violation of section 7(d) of the Act.

Wendy Philpott 2

Only listed species receive protection under the Act. However, other sensitive species should be considered in the planning process in the event they become listed or proposed for the listing prior to project completion. We recommend that you review information in the California Department of Fish and Game's Natural Diversity Data Base and that you contact the CDFG at (916) 324-3812 for information on other species of concern that may occur in this area.

If you have any questions, please contact Tim Thomas of my staff at (760) 255-8890.

Sincerely,

for Diane K. Noda
Field Supervisor

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
81440-2010-SL-0200

March 26, 2010

Virginia Strohl
Acting Chief, Central Region Biology Branch
California Department of Transportation, District 6
2015 East Shields Avenue, Suita A-100
Fresno, California 93726

Subject: Species List for the Proposed Project on U.S. Highway 395 between Post Miles 29.2 and 41.8, Inyo County, California

Dear Ms. Strohl:

This letter is in response to your request, dated and received in our office March 4, 2010, for information on endangered, threatened, proposed, or candidate species that may occur within the vicinity of the proposed project. The California Department of Transportation (Caltrans) is proposing a project on U.S. Highway 395 from just south of its junction with State Route 190 at post mile 29.2 to just north of Cartago at post mile 41.8. The Federal Highway Administration has delegated authority for consultation to Caltrans; consequently, your request and our response are made pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (Act).

This letter fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Act. Caltrans, as the delegated lead Federal agency for the project, has the responsibility to review its proposed activities and determine whether any listed species may be affected. If the project is a construction project which may require an environmental impact statement[1], Caltrans has the responsibility to prepare a biological assessment to make a determination of the effects of the action on the listed species or critical habitat. If Caltrans determines that a listed species or critical habitat is likely to be adversely affected, it should request, in writing through our office, formal consultation pursuant to section 7 of the Act. Informal consultation may be used to exchange information and resolve conflicts with respect to threatened or endangered species or their critical habitat prior to a written request for formal consultation. During this review process, Caltrans may engage in planning efforts but may not

[1] "Construction project" means any major Federal action which significantly affects the quality of the human environment designed primarily to result in the building of structures such as dams, buildings, roads, pipelines, and channels. This includes Federal actions such as permits, grants, licenses, or other forms of Federal authorizations or approval which may result in construction.

TAKE PRIDE IN AMERICA

Virginia Strohl 2

make any irreversible commitment of resources. Such a commitment could constitute a violation of section 7(d) of the Act.

Only listed species receive protection under the Act; however, sensitive species should be considered in the planning process in the event they become listed or proposed for listing prior to project completion. We recommend that you review information in the California Department of Fish and Game's Natural Diversity Data Base. You can contact the California Department of Fish and Game at (916) 324-3812 for information on other sensitive species that may occur in this area.

Should you have any questions, please contact Erin Shapiro of the Ventura Fish and Wildlife Office at (805) 644-1766, extension 369.

Sincerely,

Raymond Bransfield

Raymond Bransfield
Senior Biologist

Appendix D CNDDB List

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Scientific Name - Landscape

	Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
1	***Buteo swainsoni***	Swainson's hawk	ABNKC19070		Threatened	G5	S2		
2	***Charadrius alexandrinus nivosus***	western snowy plover	ABNNB03031	Threatened		G4T3	S2		SC
3	***Cyprinodon radiosus***	Owens pupfish	AFCNB02090	Endangered	Endangered	G1	S1		
4	***Gila bicolor snyderi***	Owens tui chub	AFCJB1303J	Endangered	Endangered	G4T1	S1		
5	***Gopherus agassizii***	desert tortoise	ARAAF01010	Threatened	Threatened	G4	S2		
6	***Gulo gulo***	California wolverine	AMAJF03010		Threatened	G4	S2		
7	***Lupinus padre-crowleyi***	Father Crowley's lupine	PDFAB2B2Z0		Rare	G1	S1.2	1B.2	
8	***Ovis canadensis sierrae***	Sierra Nevada bighorn sheep	AMALE04011	Endangered	Endangered	G4T1	S1		
9	***Sidalcea covillei***	Owens Valley checkerbloom	PDMAL11040		Endangered	G3	S3.1	1B.1	
10	***Vireo bellii pusillus***	least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2		
11	***Xerospermophilus mohavensis***	Mohave ground squirrel	AMAFB05150		Threatened	G2G3	S2S3		

Government Version -- Dated November 01, 2009 -- Biogeographic Data Branch
Report Printed on Tuesday, February 02, 2010

Information Expires 05/01/2010

Page 1

Hi Keri,

I and several of my colleagues reviewed the 395 maps and currently we do not have any concerns relative to the proximity of the new highway location to Sierra bighorn habitat. Although it comes close to the edge of the herd unit boundary, it is not a particularly sensitive portion of the unit where we would expect a high level of use by bighorn sheep. Please let me know if you need additional information. Thanks for the opportunity to review the maps.

Best,

Tom

Thomas R. Stephenson, PhD
Sierra Nevada Bighorn Sheep Recovery Program
California Department of Fish and Game
407 W. Line St.
Bishop, CA 93514
phone: (760) 873-4305
fax: (760) 872-1284
email: tstephenson@dfg.ca.gov

>>> "Keri O'Connor" <keri_oconnor@dot.ca.gov> 8/8/2008 10:09 AM >>>
Good Morning Tom-
I wanted to follow up on the email I sent you on 7/28/08 regarding the Caltrans project on 395 near through Olancha and Cartago, and its potential effect on the Sierra Nevada Bighorn Sheep. Were you able to review the maps I sent to you? I have a meeting next Friday with the Caltrans Project Development Team and would like to report any information from you to them. Thank you so much for your attention!
Regards,
Keri O'Connor
Associate Environmental Planner
(559) 243-8201

Natural Environment Study

(Addendum to the June 2003 and April 2010 NES)

Olancha/Cartago Four-Lane Project

Inyo County, California

09-INYO-395- PM 29.2/41.8

09-21340

July 2014, Revised October 2014

For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to:
Caltrans, Attn: Dena Gonzalez, Branch Chief, Central Region Biology, North Branch, 855 M Street, Suite 200 Fresno, CA 93721; (559) 445-6406 Voice, or use the California Relay Service TTY number, 1-800-735-2929.

Natural Environment Study

(Addendum to the original June 2003 and April 2010 NES)

Olancha/Cartago Four-lane Project
Inyo County, California

09-INYO-395-PM 29.2/41.8

09-21340

July 2014, Revised October 2014

STATE OF CALIFORNIA
Department of Transportation

Prepared By: Jaimee Cornwell Date: 10/1/2014
Jaimee Cornwell, Associate Biologist
(559) 445-6460
Central Region Biology, North Branch

Approved By: Dena S Gonzalez Date: 10/1/2014
Dena Gonzalez, Branch Chief
(559) 445-6406
Central Region Biology, North Branch

Summary

Project Description

The Federal Highway Administration and Caltrans are proposing the Olancha/Cartago Four-Lane Project located along a segment of U.S. Highway 395, between post miles 29.2 and 41.8, in southwest Inyo County, California. The proposed project would upgrade an approximate 12.6-mile segment of the existing conventional two-lane highway to a four-lane expressway. The selected alternative, referred to as the 4-3 Hybrid, would begin in the existing expressway south of Olancha near the crossing of Summit Creek and would be constructed on the west side of the Los Angeles Aqueduct near Olancha. After crossing Olancha Creek, the alignment would turn north to cross the Los Angeles Aqueduct and return to the existing alignment. From there, the expressway would follow the existing alignment through Cartago and north to the join the existing expressway near the crossing of Ash Creek.

Wetlands and Waters of the U.S.

Approximately 28.17 acres of U.S. Army Corps of Engineer-jurisdictional wetlands, 2.05 acres of Waters of the U.S. (WOUS) are located on or in close proximity to the project site. The project will permanently impact approximately 0.122 acres of jurisdictional wetlands and 1.271 acres of Waters of the U.S.

The table below lists each type of hydrologic resource, its acreage within or adjacent to the project site and impacts resulting from the development of the proposed project.

Hydrologic Feature	Area (acres)	Impacts (acres)
Jurisdictional Wetlands	28.17	0.122
Jurisdictional WOUS	2.05	1.271

Mitigation for impacts to jurisdictional wetlands and Waters of the U.S. will be provided through the purchase of in lieu fee credits or through off-site wetland and Waters of the U.S. creation or enhancement, as approved by the U.S. Army Corps of Engineers and Water Quality Control Board.

Federally-Listed Species

The following two federally-listed species were thoroughly reviewed based on the potential for their occurrence within the proposed project site:

Desert Tortoise (*Gopherus agassizii*)

Southwestern willow flycatcher (*Empidonax traillii extimus*)

The table below lists each species, its federal-listing status and impacts resulting from the development of the proposed project.

Species	Federal-listing	Impacts (acres)	
		Permanent	Temporary
Desert tortoise (*Gopherus agassizii*)	FT	427.06	224.22
Southwestern willow flycatcher (*Empidonax traillii extimus*)	FE	0.93	-

Mitigation for impacts to the desert tortoise and southwestern willow flycatcher will be provided through off-site land preservation, as approved by the United States Fish and Wildlife Service and California Department of Fish and Wildlife.

State-Listed Species

The following state-listed species were thoroughly reviewed based on the potential for their occurrence within the project site:

Desert tortoise (*Gopherus agassizii*)

Southwestern willow flycatcher (*Empidonax traillii extimus*)

Mohave ground squirrel (*Xerospermophilus mohavensis*)

The table below lists each species, its state listing status and impacts resulting from the development of the proposed project.

Species	State-listing	Impacts (acres)	
		Permanent	Temporary
Desert tortoise (*Gopherus agassizii*)	ST	427.06	224.22
Southwestern willow flycatcher (*Empidonax traillii extimus*)	SE	0.93	-
Mohave ground squirrel (*Xerospermophilus mohavensis*)	ST	292.9	-

As mentioned above, mitigation for impacts to the desert tortoise and southwestern willow flycatcher will be accomplished through off-site land preservation, as approved by the United States Fish and Wildlife Service and California Department of Wildlife. The mitigation land to be purchased to compensate for impacts to the desert tortoise, are expected to also benefit the Mohave ground squirrel.

State Sensitive Species

The following state-sensitive species were thoroughly reviewed based on the potential for their occurrence within the project site:

Burrowing owl (*Athene cunicularia*)

Loggerhead shrike (*Lanius ludovicianus*)

Spotted bat (*Euderma maculatum*)

Owen's Valley vole (*Microtus californicus vallicola*)

The table below lists each species, its state-listing status and impacts resulting from the development of the proposed project.

Species	State-listing	Impacts (acres)	
		Permanent	Temporary
Burrowing Owl (*Athene cunicularia*)	CSC	427.06	224.22
Loggerhead shrike (*Lanius ludovicianus*)	CSC	427.06	224.22
Spotted bat (*Euderma maculatum*)	CSC	0.93	-

Owen’s Valley Vole (*Microtus californicus vallicola*)	CSC	0.122	-

Mitigation for impacts to the burrowing owl and loggerhead shrike are expected to be compensated for along with those of the desert tortoise, as it is expected the same mitigation land that will benefit the desert tortoise will also benefit the burrowing owl and loggerhead shrike. Mitigation for impacts to the spotted bat will be compensated for along with those of the southwestern willow flycatcher, as it is anticipated the same mitigation land will benefit both species. Compensation for impacts to wetlands is expected to benefit the Owen’s Valley vole as long as the mitigation efforts are able to be accomplished within the Owen’s Valley.

Permits and Agreements

The following permits and agreements will need to be obtained for the project:

Section 404 Nationwide Permit from the U.S. Army Corps of Engineers

Section 401 Water Quality Certification from the Regional Water Quality Control Board

Section 1600 Streambed Alteration Agreement from the California Department of Fish and Wildlife

2081 Incidental Take Permit from the California Department of Fish and Wildlife

Special Provisions

In addition to the mitigation described above, special provisions will also require the establishment of Environmentally Sensitive Areas, Worker Environmental Awareness Training and biological monitors, and will be included in the construction contract for the protection of biological resources potentially impacted by the project as well as to prevent the spread of invasive species of plants.

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List of Abbreviated Terms

BA	Biological Assessment
BLM	Bureau of Land Management
BMP’s	Best Management Practices
BSA	Biological Study Area
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
CWUS	Culverted waters of the United States
dbh	Diameter at breast height
ESA	Environmentally Sensitive Area
FHWA	Federal Highway Administration
ft	Foot/Feet
GPS	Global Positioning System
Hwy	United States Highway
LA	Los Angeles
LADWP	Los Angeles Department of Water and Power

MGS	Mohave ground squirrel
Mph	Miles per hour
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NWL	Noxious Weed List
OHWM	Ordinary High Water Mark
PM	Post Mile
PIA	Project Impact Area
RoW	Right of Way
RWQCB	Regional Water Quality Control Board
SWCA	Morro Group, a Division of SWCA
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WOUS	Waters of the United States

Chapter 1. Introduction

The purpose of this Natural Environmental Study (NES) is to provide technical information and to review the proposed project in sufficient detail to determine to what extent it may affect threatened, endangered or proposed species as well as other natural resources. This NES has been prepared in accordance with the California Department of Transportation (Caltrans) regulations, policy and guidance. This document presents technical information upon which decisions regarding project impacts have been developed.

1.1. Project History

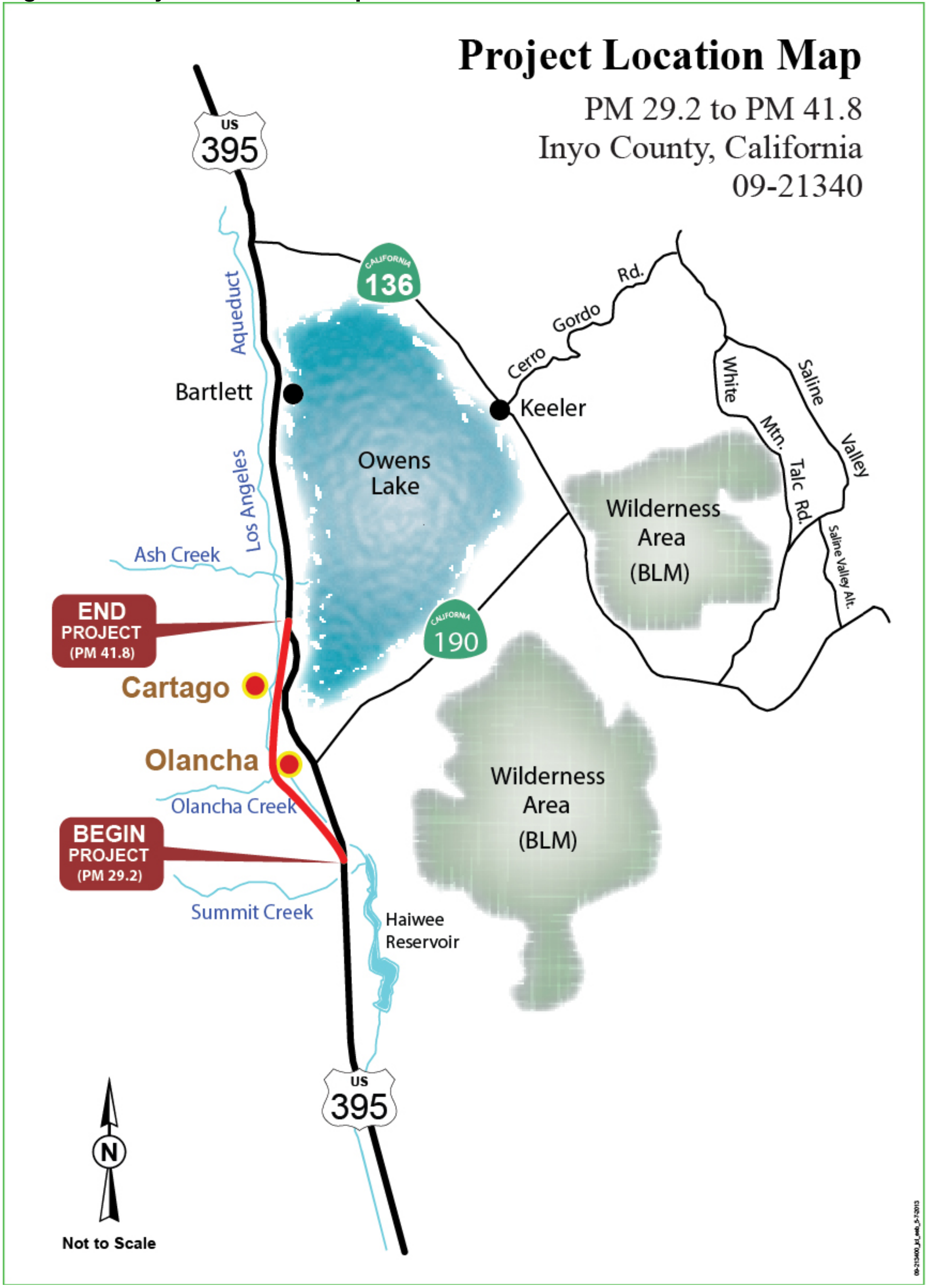
Caltrans as the state California Environmental Quality Act (CEQA)-lead Agency, the Federal Highway Administration (FHWA) as the federal National Environmental Policy Act (NEPA)-lead Agency, are proposing to upgrade a segment of the existing conventional two-lane highway to a four-lane expressway on a portion of U.S. Highway 395 (Hwy 395) near the communities of Olancha and Cartago in Inyo County, California (Figures 1 and 2). The Bureau of Land Management (BLM) is a cooperating agency.

1.1.1. Project Purpose

The proposed upgrade will improve route continuity, reduce congestion, and improve the overall operation of the highway. The Caltrans District 9 Transportation Planning Branch initiated the project with support from the Inyo County Local Transportation Commission.

Figure 1: Project Vicinity Map

Figure 2: Project Location Map



1.2. Project Description

Five build alternatives and one "no-build" alternative were considered. The preferred alternative is an alignment referred to as the "4-3 Hybrid" because it is comprised of portions of previously proposed Alternatives 3 and 4.

The 4-3 Hybrid would construct a controlled access four-lane divided expressway for the entire length of the project. The new expressway would extend the existing four-lane expressway south of Olancha near the crossing of Summit Creek, and would realign a portion of the highway on the west side of the Aqueduct near Olancha. After crossing Olancha Creek, the new alignment would turn north to cross the Aqueduct and continue northeast to return to the existing alignment. From there, the expressway would follow the existing alignment through Cartago and north to join the existing expressway near the crossing of Ash Creek. This alternative would provide the ultimate concept facility for Hwy 395, a controlled access four-lane divided expressway, throughout the length of the project.

The proposed segments of this alternative are as follows:

- Begin Work – 1.4 miles south of L.A. Aqueduct Bridge, #48-10 (PM 29.2): the existing lanes would be rehabilitated for use as northbound and southbound lanes.

- 1.3 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.0): new northbound and southbound lanes would be constructed west of the existing highway and would travel west of Olancha and the Aqueduct. After crossing Olancha Creek, the new lanes would cross the Aqueduct and return to the existing alignment south of Cartago.

- 0.3 miles south of Lake Street (PM 37.3): new northbound and southbound lanes would be constructed west of the existing highway and would pass through Cartago between the existing highway and Pine Street.

- 1.7 miles north of Whitney Street (PM 39.0): the existing lanes would be rehabilitated for use as the northbound lanes and new southbound lanes would be constructed to the west. The southbound lanes would diverge to the west to avoid an existing utility corridor.

- 1.7 miles south of Ash Creek Bridge, #48-11 (PM 40.1): the southbound lanes would return to the northbound lanes and the existing lanes would be rehabilitated for use as the southbound lanes. New northbound lanes would be constructed to the east.

- End Work – 0.2 miles south of Ash Creek Bridge, #48-11 (PM 41.8).

Although the project has been described in segments above, it will not be phased over time; the entire 12.6-mile length will be constructed as one project. Construction is scheduled to begin during the spring of 2017 and is anticipated to last approximately two years, or until the spring of 2019. It is anticipated that project work will be continuous during the two-year period and that there will not be any seasonal shutdowns. In addition to the new alignment, two vehicle staging areas and a soil borrow site have also been included as a part of the proposed project.

The new expressway would be built on an independent alignment and would consist of an asphalt concrete surface on an aggregate base, and a sub-grade constructed on earthen excavations and embankments. Two new concrete structures will be required to span the Los Angeles Aqueduct and approximately 80 to 85 reinforced concrete box and corrugated metal pipe culverts will be installed to convey cross-drainage under the new expressway. Minor items of work associated with the project would include constructing temporary storm water and permanent erosion control measures, installing new right of way fencing, installing new metal beam guard railing, and placing new signs and pavement delineation. The total area to be cleared for the proposed project is approximately 270 acres and approximately 120 acres of this will be paved.

In addition to the project work described above, prior to construction, existing utilities (fiber optics, underground telephone lines and possibly power lines) will need to be relocated. The details of this have not yet been decided upon, and involve coordination with private utility companies; however, if additional areas that support biological resources are impacted, they will be mitigated for in kind, as with the other impacts that have been outlined in this document. Furthermore, if any new impact areas are identified outside of the Biological Study Area described in this document, the appropriate biological surveys will be completed to determine, which species may be impacted.

The project milestones are provided below in Table 1.

Table 1:Project Schedule

Project Milestones	Scheduled Delivery Date
Project approval and final Environmental Document	February 1, 2015
Project Ready to List for contract bidding	September 1, 2016
Construction begins	April 1, 2017
Construction completed	April 1, 2019

1.3. Construction Guidelines

The contractor will follow best management practices during construction. Parking of equipment, project access, supply logistics, equipment maintenance and other project-related activities will occur within the Caltrans right-of-way (RoW) or within temporary construction easements. Dust control measures are included in this project.

A description of the type and purpose of equipment likely to be used during the construction of the project is outlined in Table 2 below.

Table 2: Construction Equipment

Road Construction Equipment	Road Construction Purpose
Asphalt paver/roller	Asphalt-concrete delivery/placement
Backhoe	Soil manipulation and drainage work
Bulldozer/loader	Earthwork construction, clearing and grubbing
Crane (rubber tire)	Drainage work
Crusher/processing equipment	Aggregate production
Dump truck	Material removal, earthwork activities
Excavator with a bucket	Soil manipulation
Flat-bed truck	Drainage work
Front-end loader	Dirt or gravel manipulation
Generator	General work
Motor grader/Blade	Ground leveling
Haul truck	Earthwork construction, clearing and grubbing
Paint/striping truck	Pavement striping/delineation
Pavement Grinder	Pavement construction
Pavement roller	Pavement construction
Pick-up/Equipment Truck	General work
Roller/compactor	Earthwork construction
Roller screeds	Pavement construction
Saw cutting/striping equipment	Pavement construction
Scraper	Earthwork construction
Sweeper	General work
Truck with seed sprayer	Landscaping
Water truck	Earthwork construction and dust control
Bridge Construction Equipment	Bridge Construction Purpose
Backhoe	Soil manipulation and drainage work
Bidwell screeds	Bridge pavement construction
Compactor	Foundation earthwork
Compressor	Bridge structure construction
Concrete pump	Pavement construction
Crane (rubber tire and large crawler)	Bridge foundation and concrete superstructure construction
Excavator with a bucket	Soil manipulation

1.4. Document Preparation History

Document Preparer: Jaimee Cornwell

Degree: Bachelor of Arts in Biology, University of Montana, December 2001.

Experience: Twelve years of professional experience in the field of Biology.

The following documents are associated with the current project:

- The Olancha/Cartago Four-Lane Project Natural Environmental Study (NES), June 2003.

- Olancha/Cartago Four-Lane Project Botanical Survey Report, October 2008.
- Jurisdictional Delineation for the Olancha/Cartago 4-Lane Project, July 2009.
- The Olancha/Cartago Four-Lane Project Natural Environmental Study (NES), April 2010.
- Route 395 Olancha/Cartago Four-Lane Project Desert Tortoise Survey, December 2012.
- Olancha/Cartago Four-Lane Biological Assessment, September 2013.

Chapter 2. Study Methods

This chapter describes the scope and scale of database queries and field study methods used to evaluate habitat and determine the potential presence of federally- and state-endangered, threatened, or proposed species and other sensitive species and natural communities without an official listing status within the proposed project area. It also discusses the rationale for determining the Biological Study Area and Project Impact Area.

2.1. Regulatory Requirements

2.1.1. National Environmental Policy Act /California Environmental Quality Act

The National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.) establishes a mandate for Federal agencies to consider the potential environmental consequences of their proposals, document the analysis, and make this information available to the public for comment prior to implementation.

The California Environmental Quality Act (CEQA) (P.R.C. 21000 et seq.) establishes State policy to prevent significant impacts to the environment by requiring alternative analysis and mitigation measures. CEQA applies to actions directly undertaken, financed, or permitted by State lead agencies.

2.1.2. Wetlands and Other Jurisdictional Waters of the United States

Wetlands and other jurisdictional waters of the United States (WOUS) are protected by several federal and state laws and regulations. The Clean Water Act (CWA) (33 U.S.C. 1251-1376) provides federal protection by regulating the discharge of dredged or fill material into wetlands or WOUS.

WOUS include all waters which in the past were, currently are or may be used in the future for interstate or foreign commerce, including intermittent streams, wetlands, and all waters subject to the ebb and flow of the tide. Wetlands are generally under normal circumstances classified as jurisdictional when they meet three specific requirements which include the presence of hydrophytic (water loving) vegetation, hydric soils (soils prone to saturation or inundation), and wetland hydrology.

Section 404 of the CWA gives the USACE authority to issue permits for the discharge of dredged or fill material in WOUS including wetlands provided the Nation’s waters would not be significantly degraded and it’s the most practicable alternative. This section also provides the United States Environmental Protection Agency (EPA) the authority to issue guidelines for implementation of this section as well as veto power over USACE permit decisions.

Executive Order 11990 Protection of Wetlands (May 24, 1977) also establishes policy that on federally funded projects, effects on wetlands must be described in the environmental document and alternatives that avoid wetlands must be considered. If wetland effects cannot be avoided, then all practicable measures to minimize harm must be included. The U.S. Department of Transportation (DOT) announced DOT Order 5660.1A in 1978 to comply with this direction and the FHWA reviews environmental documents for compliance.

State protection over wetlands and other Waters of the State is regulated primarily by the California Department of Fish and Wildlife (CDFW) and the Regional Water Quality Control Board (RWQCB). Section 1602 of the CDFW code requires notification prior to any activities that may substantially alter the flow, bank, depth, or channel of any lake or stream. If it is determined that the proposed activity may adversely affect fish or wildlife resources a Lake or Streambed Alteration Agreement will be necessary from CDFW which incorporates minimization and/or mitigation measures into the construction contract to ensure the project is in compliance with CEQA.

Section 401 of the CWA requires that any applicant of a federal license or permit allowing the discharge of dredged or fill materials into WOUS including wetlands, must first acquire certification from the state agency responsible for and having jurisdiction over those waters that the action complies with state laws and regulations. The RWQCB, established by the Porter-Cologne Water Quality Control Act, is the agency responsible for making that determination and issuing 401 Certifications in California.

2.1.3. Plant Species

Plants with special status are provided protection by several federal and state laws and regulations. While many plants are grouped into special status terms, there are varying levels of that status and some involve greater protection than others.

The Federal Endangered Species Act (FESA) (16 U.S.C. 1531-1543) provides protection for plant species listed as threatened, endangered, or candidate- which may be proposed for listing in the future. Section 9 of the FESA prohibits the taking of listed species; however, there are two sections (7 and 10) of the FESA that authorize take when that take is incidental to an otherwise lawful activity. Sections 7 and 10 are briefly described as:

- Section 7 of the FESA provides that federal agencies consult with agencies responsible for administering FESA, either the USFWS or National Marine Fisheries

Service (NMFS) depending on the species in question, to ensure that actions they authorize are not likely to jeopardize the continued existence of listed species or adversely modify critical habitat of those species;

- Section 10 of FESA establishes a process where a non-federal entity may be allowed take of a listed species when that take is incidental to an otherwise lawful activity. This section also requires that a Habitat Conservation Plan (HCP) be submitted.

The California Endangered Species Act (CESA) (Fish and Wildlife Code 2050 et seq.) establishes policy of the State to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA provides that state agencies shall not authorize actions that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There is no mandated consultation process under CESA. However; as in the FESA, there are sections in CESA which may allow take provided the take is incidental to an otherwise lawful activity, they are briefly described below:

- The first section (2080.1) is used when a species is listed as threatened or endangered by both FESA and CESA. This section must determine that an incidental take permit that has been issued for a federally-listed species, is consistent with the provisions in CESA, and as such is termed a “consistency determination”. If this determination is met no further action is necessary and the take of a state-listed species is also authorized by the federal incidental take permit.

- In the case of a state-only-listed species or in the event a federal incidental take permit is determined to be inconsistent with CESA, Section 2081 provides a means where a state-listed species may be taken provided that the take of the species is incidental to an otherwise lawful activity. Section 2081 also requires that any impacts of the authorized take be fully mitigated.

In addition to protection afforded by FESA and CESA, rare native plants are provided protection by the California Native Plant Protection Act, CDFW code, Sections 1900-1913. CDFW code, Sections 1925-1926 also protects native plants in California deserts by enforcing provisions of the California Desert Native Plant Act (Food and Agriculture Code 80001-80006). This act protects California desert native plants from unlawful harvesting on both public and privately owned lands.

Special consideration is also provided for native plants that have been designated by the California Native Plant Society (CNPS) as rare, threatened, or endangered in California.

The Bureau of Land Management (BLM) also provides protection for plants, which have been determined to be of special status. According to the BLM, special status plants include:

- Those that are federally- endangered, threatened, or proposed;
- Those that are not federally-listed as endangered, threatened, or proposed, but which have been designated for special management considerations by the BLM State Director. By national policy, federal candidate species are automatically treated as sensitive. The California State Director has also conferred sensitive status on California State- endangered, threatened, or rare species, species that are included on the CNPS List 1B (plants defined as rare and endangered in California and elsewhere) unless excluded by the State Director on a case-by-case basis, and on certain other plants the State Director believes meet the definition of sensitive.

2.1.4. Animal Species

As discussed above for plant species, both CESA and FESA provide protection for animal species and follow the same processes as the protections for plant species, including consultation mandated by FESA and the need for either a consistency determination (2080.1) for federal- and state-listed species, or a 2081 permit when the proposed activity involves take of a state-only-listed species.

The Migratory Bird Treaty Act (16 U.S.C. 703-711) provides protection for all migratory birds, their nests, eggs and feathers and makes it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill shared migratory bird resources. This act does not provide any means where take is authorized.

There are also several CDFW Codes that provide protection for animal species. Sections 3511, 4700, 5050, and 5515 all designated certain species as fully protected species. There is no take authorization available for species listed as fully protected. Section 4150 provides protection for all nongame mammals such as bats. There are take authorizations exempting parties from this section provided it can be proved that the nongame mammals are injuring crops or other property.

The BLM also designates animals as special status, following the same guidelines as those described above for plants.

2.1.5. Invasive Species

Executive Order 13112 Invasive Species (February 3, 1999) requires federal agencies to work cooperatively to prevent and control the spread of invasive plants and animals.

Caltrans has issued guidance in order to comply with this order and requires that a NEPA analysis for an action include an analysis of the probability of the action to cause or promote the introduction or spread of invasive species.

2.2. Studies Required

In order to determine which studies may be required as part of the proposed project, a literature review is completed first. This review identifies potential sensitive resources that may require further evaluation. Secondary to a literature review is a reconnaissance level field visit to verify information discovered during the literature review and either confirm or discount the need for further studies pertaining to specific species or sensitive communities. Finally, specific studies or protocol level surveys are performed to further verify presence or absence of sensitive resources. These studies also include general plant and animal species inventories, as well as wetland delineations, when applicable.

2.2.1. Literature Review

Species lists were obtained from the following database queries in order to determine which federally- and state-listed, proposed and/or sensitive plant and animal species have the potential to occur within the BSA:

- USFWS, Ventura Office, Official Species List for the project site based on post miles (Appendix A).

- California Natural Diversity Database (CNDDB 2012) species list for the following United States Geological Survey (USGS) 7.5-minute topographical quadrangles: Bartlett, Cirque Peak, Coso Junction, Haiwee Pass, Haiwee Reservoirs, Lone Pine, Long Canyon, Monache Mountain, Olancha, Owens Lake, Templeton Mountain, Upper Centennial Flat and Vermillion Canyon (Appendix A).

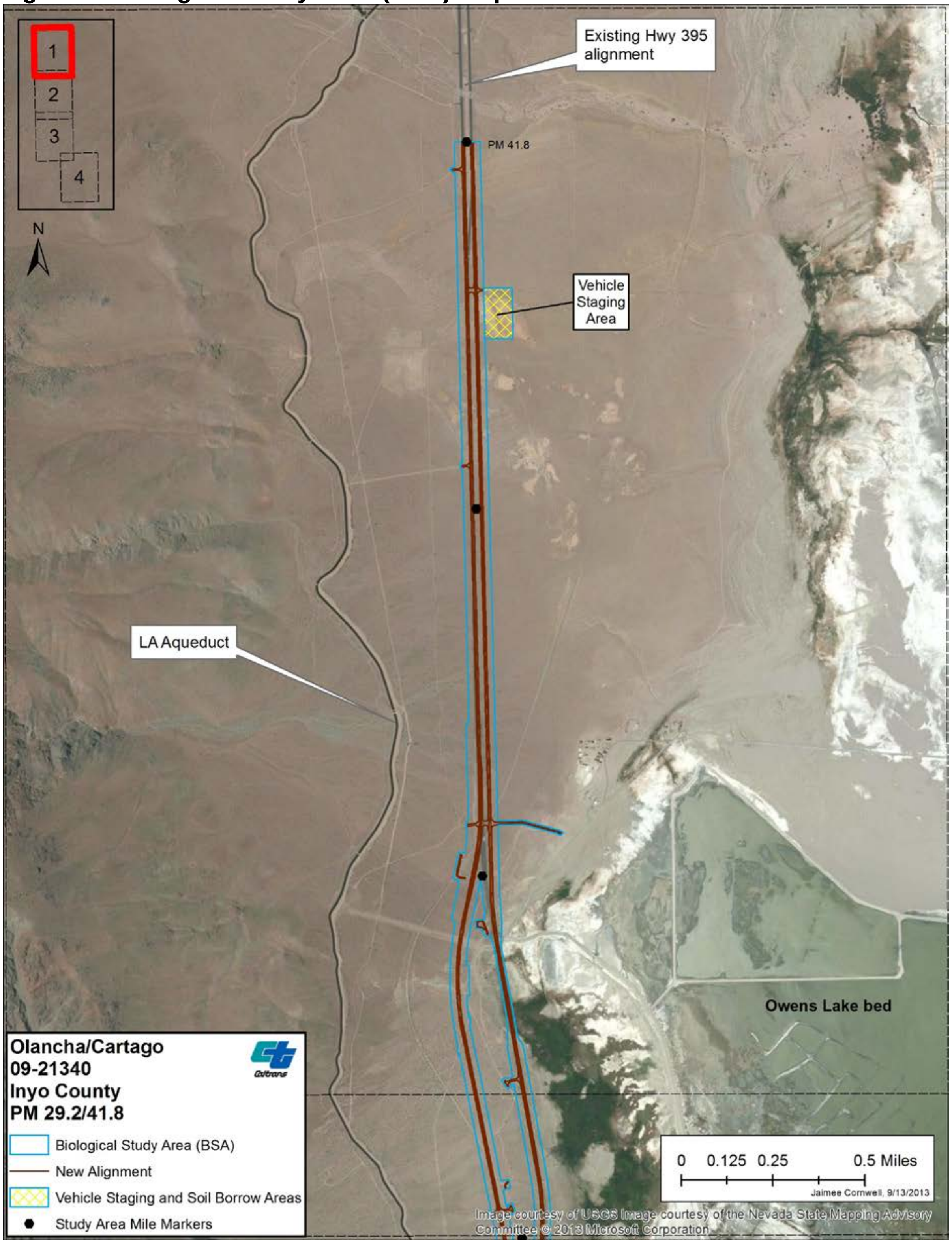
- California Native Plant Society (CNPS) Online Inventory for the same quadrangles (Appendix A).

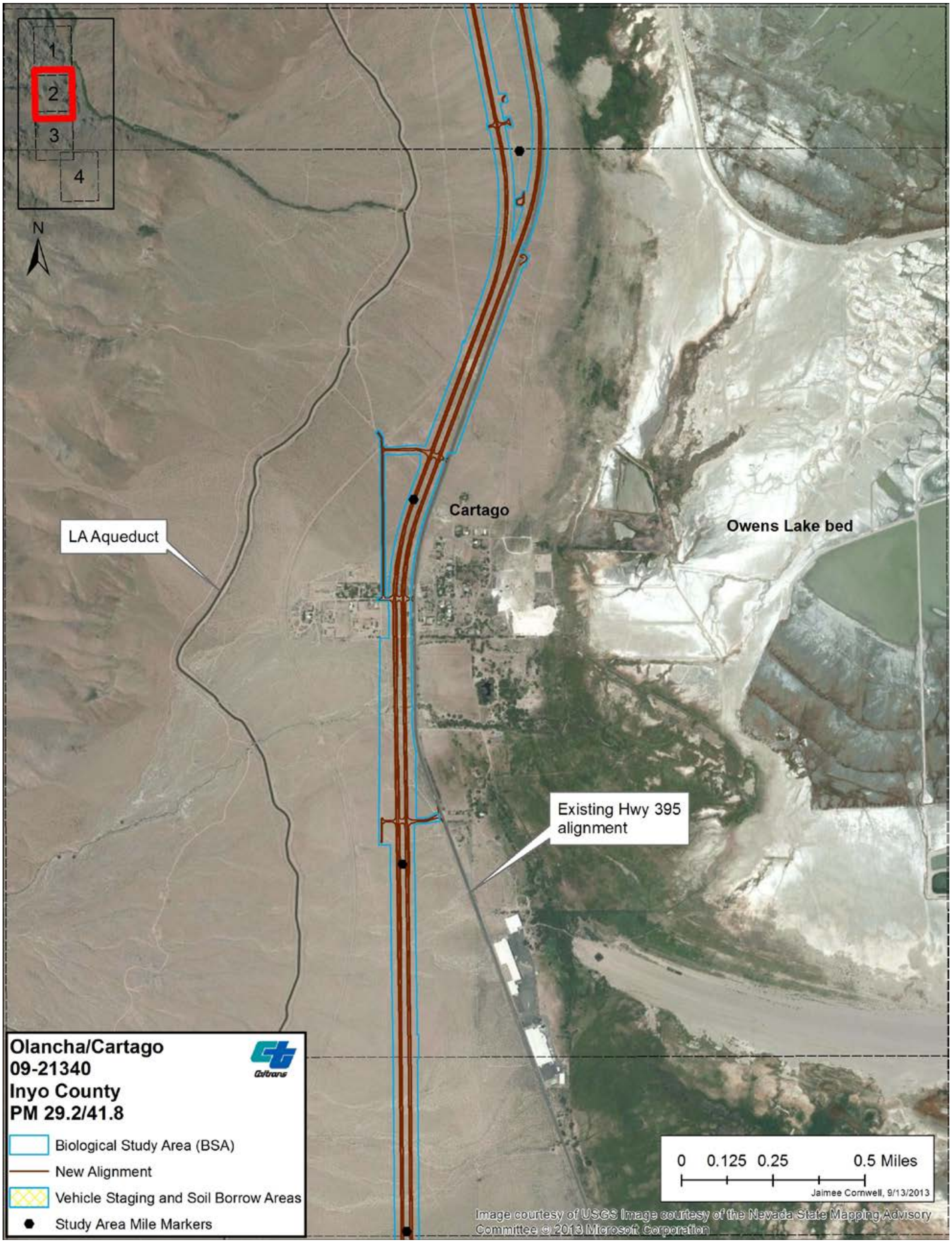
2.3. Biological Study Area

The Biological Study Area (BSA) is defined as the area covered during the Caltrans and consultant-contracted biological studies conducted for the proposed project. The BSA is comprised of the Project Impact Area (PIA), the proposed Caltrans right-of-way (RoW), and additional areas designated for vehicle staging and/or soil borrow. The BSA extends the entire length of the project (PM 29.2 to 41.8) and is shown on Figure 3.

The PIA is generally contained within the BSA and is defined as the areas that will be permanently impacted by cut and fill as a result of project construction. The proposed RoW encompasses the entire PIA and extends beyond the PIA boundary by a range of approximately 40 to 110 feet, depending on location. The soil borrow site, located southwest of Olancha, has also been included as an area of permanent impact; although this area will not be paved or permanently developed. The vehicle staging areas, as well as all other areas located outside of the PIA, but within the RoW, will be temporarily impacted by construction of the project.

Figure 3: Biological Study Area (BSA) Map

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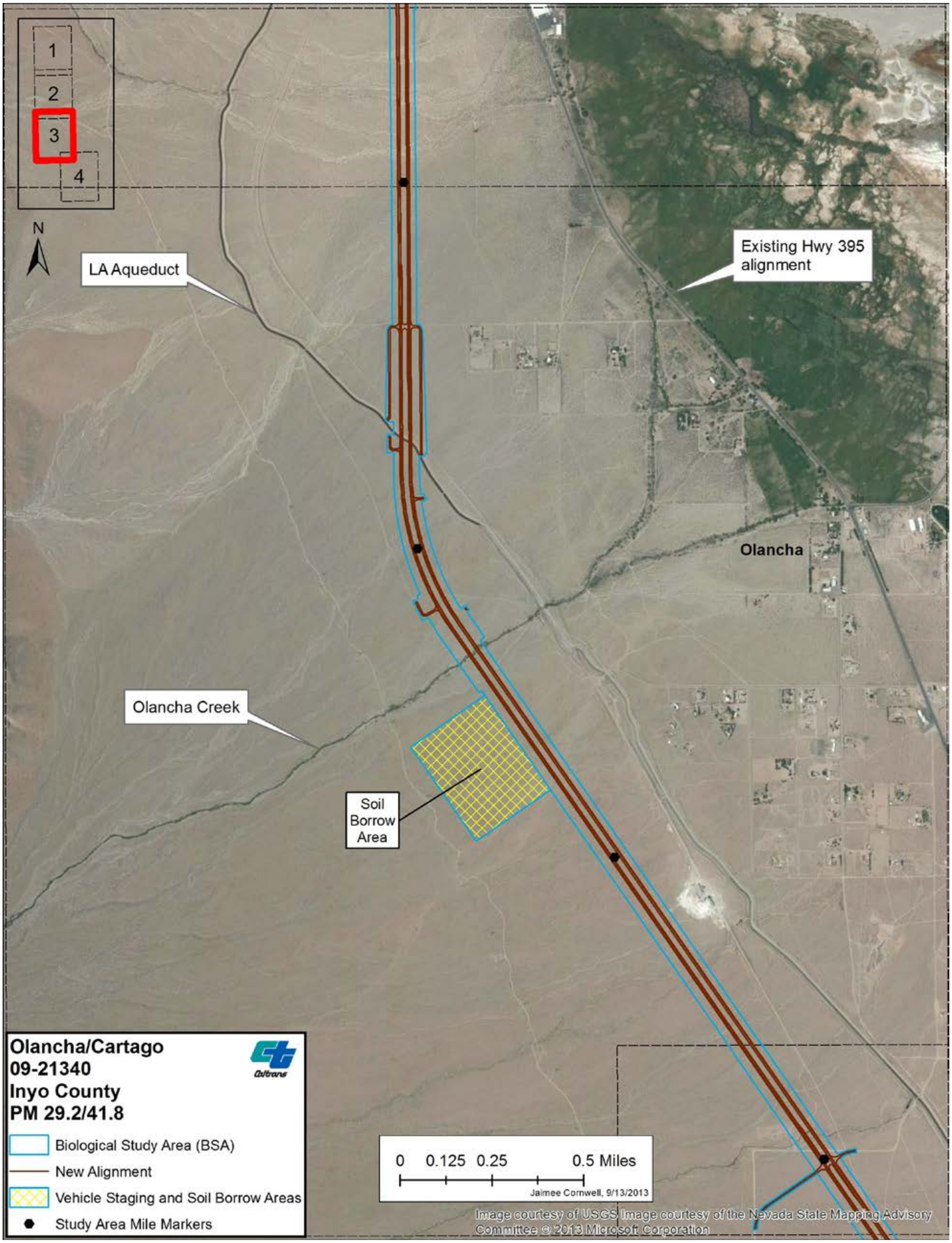
Owens Lake bed
LA Aqueduct
Existing Hwy 395
alignment
Olancha/Cartago
09-21340
Inyo County
PM 29.2/41.8
Biological Study Area (BSA)
New Alignment
Vehicle Staging and Soil Borrow Areas
Study Area Mile Markers
0 0.125 0.25 0.5 Miles
Jaimee Cornwell, 9/13/2013
Image courtesy of USGS Image courtesy of the Nevada State Mapping Advisory Committee © 2013 Microsoft Corporation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Existing Hwy 395 alignment
Olancha
Olancha Creek
Soil Borrow Area
Olancha/Cartago
09-21340
Inyo County
PM 29.2/41.8
Caltrans
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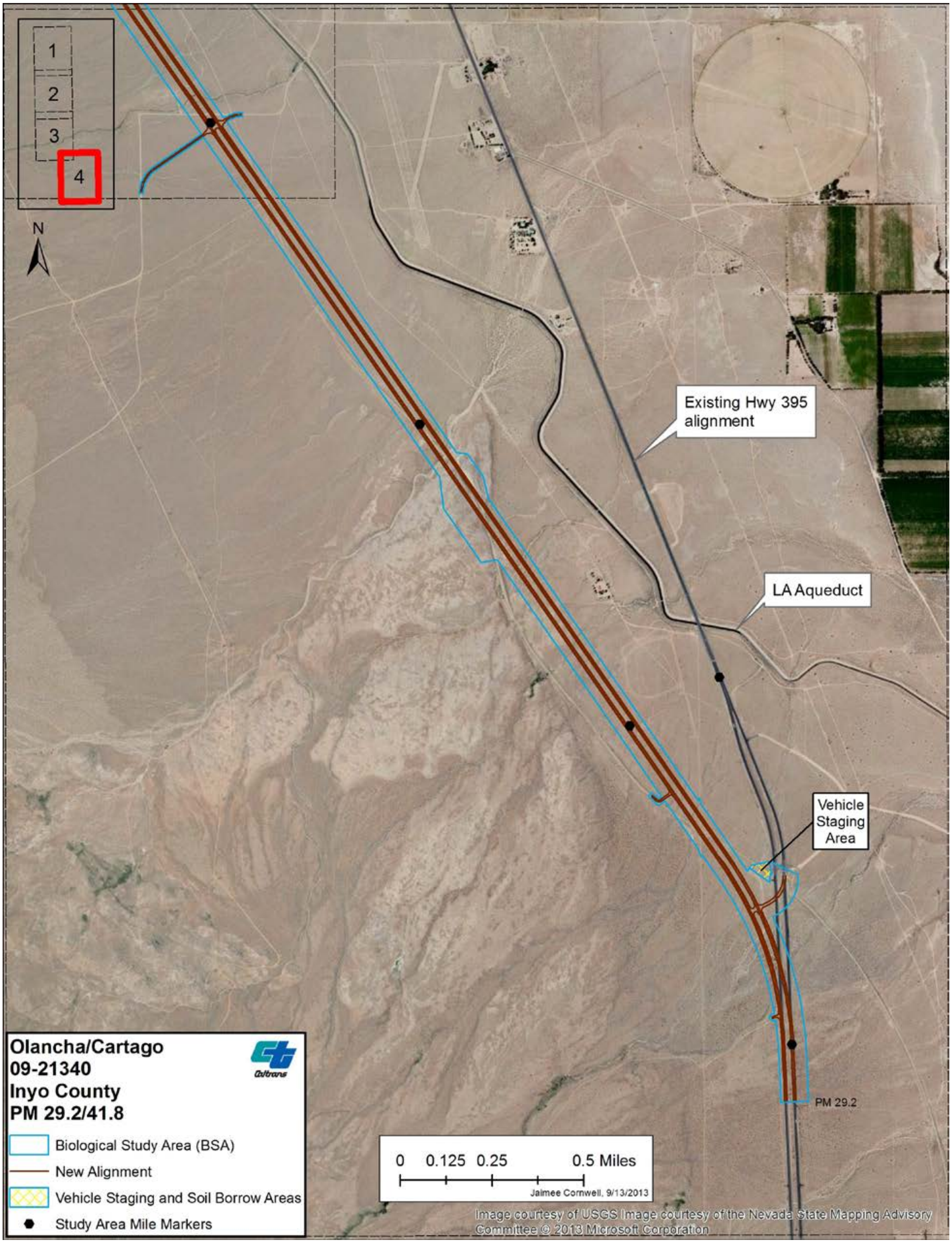
0 0.125 0.25 0.5 Miles
Jaimee Cornwell, 9/13/2013
Image courtesy of USGS Image courtesy of the Nevada State Mapping Advisory Committee © 2013 Microsoft Corporation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Olancha/Cartago
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Inyo County
PM 29.2/41.8
Caltrans
Biological Study Area (BSA)
New Alignment
Vehicle Staging and Soil Borrow Areas
Study Area Mile Markers
0 0.125 0.25 0.5 Miles
Jaimee Cornwell, 9/13/2013
Image courtesy of USGS Image courtesy of the Nevada State Mapping Advisory Committee © 2013 Microsoft Corporation

2.3.1. Reconnaissance Surveys

Reconnaissance surveys were completed by Caltrans biologists to verify information discovered during the literature review and either confirm or discount the need for further studies pertaining to specific species or sensitive communities. These surveys consisted of driving the project area and documenting existing habitat. This information was then utilized to identify areas that may require more focused studies.

2.3.2. Wetlands and Waters of the United States (WOUS) Delineation

In 2009, URS biologists conducted jurisdictional wetland and WOUS delineation to determine the type and extent of potentially jurisdictional hydrologic features within the BSA. The delineation was conducted in accordance with the United States Army Corps of Engineers (USACE) *1987 Wetlands Delineation Manual* (Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE 2008) and the *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008). Field surveys were conducted from April 28 to May 6, 2009 and covered the following proposed alternatives: 1, 2, 2A, 3 and 4.

The wetland boundaries were determined using the three-parameter approach outlined by the USACE, which examines hydrology, soils and vegetation. The boundaries of WOUS were determined following the methods outlined by Lichvar and McColley (2008). A *Jurisdictional Delineation Report for the Olancha/Cartago 4-Lane Project* was prepared and submitted to the USACE for verification (URS 2009). For the complete details of the jurisdictional delineations within the project site, refer to the above-mentioned report completed by URS.

2.3.3. Botanical Surveys

Two formal botanical surveys were conducted for the proposed project. Both of the formal botanical surveys were “floristic” in nature and thus every plant observed within the BSA during these surveys was identified to the taxonomic level necessary to determine whether or not the subject plant was rare and/or listed. Furthermore the timing of all site visits during these surveys was such that any sensitive plants with a potential to occur within the BSA, would be flowering during each respective survey period, thereby allowing for a positive identification of sensitive species, if observed. Any species of plants that were not identified in the field were collected and later identified using a dissecting microscope, field guides and dichotomous keys.

The first formal botanical surveys were conducted during April 16-20, April 23-27 and April 30-May 4, 2001 and covered lands occupying the following proposed project alternatives: 1, 2, 2a, 3 and 3a. Ellen Cypher, of ESRP, coordinated the surveys and prepared the survey protocol that was used and four other ESRP staff members helped to complete the surveys (Caltrans 2003).

A second round of formal botanical surveys was conducted in 2008 by SWCA staff for Alternative 4. These surveys were conducted in accordance with the CDFW *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened and Endangered Plants and Natural Communities* (CDFW 2000). The field surveys were conducted by three biologists walking a series of parallel transects throughout the BSA and took place during April 7-11, April 21-26 and June 2-6, 2008 (SWCA 2008).

In addition to the formal botanical surveys conducted in 2001 and 2008, two informal follow-up surveys, targeting specific habitats or sensitive species, were conducted in 2002 and 2013. The first informal follow-up survey conducted in 2002 was completed by ESRP staff and only covered potentially moist alkali meadow habitats that occurred within, or in close proximity to, Alternatives 1, 2, 2a, 3 and 3a. The second informal follow-up survey was conducted in 2013 in the extreme northern portion of the selected 4-3 Hybrid, in the BSA near Willow Dip. This informal survey only targeted the following three species: Inyo County star-tulip (*Calochortus excavatus*), Inyo phacelia (*Phacelia inyoensis*) and the Owen's Valley checkerbloom (*Sidalcea covillei*).

A complete list of all botanical species observed, comprised from the two formal botanical surveys and the two informal follow-up surveys, is included in Appendix B.

2.3.4. Wildlife Surveys

2.3.4.1. DESERT TORTOISE

USFWS-approved surveys were initially conducted for the federal- and state-threatened, desert tortoise, on June 20, 21 and 22, 2001. The surveys followed the protocol outlined in the USFWS *Field Survey Protocol for any Federal Action That May Occur within the Range of the Desert Tortoise* (U.S. Department of the Interior (USDI) USFWS 1992) and consisted of walking 100 percent of those parcels whose owners granted access to the survey crew. These surveys covered portions of the previously considered alternatives (1, 2, 2a, 3 and 3a) and specifically covered parcels located south of Olancha Creek, which are located immediately west of the existing

Hwy 395 alignment; therefore the parcels covered during the 2001 surveys do not coordinate with the parcels occupied by the selected 4-3 Hybrid alignment.

In 2012 USFWS-approved biologists from ECORP Consulting, Inc. conducted surveys for the desert tortoise on lands occupied by the selected 4-3 Hybrid alternative. Surveys were conducted in accordance with the methods outlined in *Preparing for Any Action that May Occur within the Range of the Mojave Desert Tortoise* (USFWS 2010). The surveys included one hundred percent coverage throughout the majority of the proposed PIA and additionally included three belt transects, surrounding the PIA at 656-, 1312- and 1968-foot intervals. The surveys were conducted between October 22 and November 2, 2012 (DETO 2012).

2.3.4.2. Swainson's Hawk and Other Raptor Surveys

In 2001 when the project surveys began, there was no published survey protocol available for Swainson's hawks. However, recommendations concerning timing and methodology were obtained from the Swainson's Hawk Technical Advisory Committee, who were consulted on May 31, 2000. Their recommendations included conducting surveys from mid-March to mid-April to detect staging pairs. Morning surveys are preferred, although evening surveys may be successful because Swainson's hawks are likely to be sitting in their staging trees at those times. Surveys during mid-day are considered less successful because Swainson's hawks typically soar high and far from nest sites.

Surveys for Swainson's hawks were conducted on March 18 and 24 in 2001. The surveys were included as part of the studies conducted for proposed Alternatives 1, 2, 2a, 3 and 3a. The surveys were conducted from 6:30 to 9:30 am and 4:00 to 6:00 pm, and were specifically timed to occur before trees had leafed out. The project area was driven and walked in an effort to locate any stick nests in trees, and for the visual identification of Swainson's hawks and other raptors. All species of raptors were additionally watched for and recorded during the other project surveys.

2.3.4.3. Habitat Assessment Surveys

Two habitat assessment surveys were conducted to determine the potential presence of habitat for the Southwestern willow flycatcher and the least Bell's vireo within the project site. Habitat, along the segment of Olancha Creek that will be impacted by the selected 4-3 Hybrid, was analyzed based on the habitat requirements outlined in the following documents: *A Willow Flycatcher Survey Protocol for California* (Bombay et al. 2003), *A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher* (Sogge et al. 2010), *Endangered and Threatened Wildlife and*

Plants; Designation of Critical Habitat for the Southwestern Willow Flycatcher; Final Rule (USFWS 2013), *Least Bell's Vireo (Vireo bellii pusillus)* (Kus 2002), and *Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Least Bell's Vireo; Final Rule* (USFWS 1994). The habitat surveys were conducted by two Caltrans biologists and one URS Biologist; the survey dates were October 3, 2012 and February 6, 2013.

2.3.4.4. BAT SURVEYS

Bat surveys were conducted in 2001 in various locations along the Union Pacific Railroad grade, which extends south to north and parallels Hwy 395, west of its existing alignment. The surveys were conducted as a part of the studies completed for previously proposed alternatives 1, 2, 2a, 3 and 3a.

2.3.4.5. NOCTURNAL SMALL MAMMAL SURVEYS

Surveys for nocturnal small mammals were conducted between October 8th and 11th in 2001. Trap lines were placed at nine locations along the project and were selected to include all major habitat types within the study area. The traps were specifically placed in areas with evidence of recent small mammal activity, such as at burrows, diggings and dust baths in order to maximize the potential for captures. A total of 450 traps were sampled nightly for four consecutive nights. Each animal captured was identified to species, sexed, weighed, aged as well as assessed for reproductive maturity. Each animal that was captured was marked on the flank with a black permanent marker so recaptured individuals could be identified.

2.3.4.6. MOHAVE GROUND SQUIRREL SURVEYS

Reconnaissance level surveys and focused trapping for the Mohave ground squirrel were conducted in 2001 and 2002. During the reconnaissance surveys it was determined that potential habitat existed within the project limits of the previously proposed alternatives (1, 2, 2a, 3 and 3a). Much of the area is characterized by deep, fine-grained alluvial soils that provide a good substrate for rodent burrows. The vegetation is typical of that found in many areas of the western Mojave desert where Mohave ground squirrels have been reported. Saltbush species, such as shadscale (*Atriplex confertifolia*), allscale (*A. polycarpa*), and creosote bush (*Larrea tridentata*) dominate the shrub community in the project area west of Hwy 395. Shrub species richness is high throughout much of the area, with 15-19 shrub species noted at a number of sites.

Based on the reconnaissance surveys, ten sites were selected for trapping based upon their habitat suitability, access, lack of development and/or human disturbance, and distribution within the project area. These sites were on undeveloped lands to the west of the existing Hwy 395 alignment. The trapping grids (Grids 1-10) were placed about 1 mile apart and were selected to include all suitable habitats present within the study area. All of the selected sites supported desert shrub communities that appeared to provide suitable habitat for the Mohave ground squirrel.

The trapping was carried out for five consecutive days on all of the ten trapping grids, during April 1-13 and May 6-18, 2001. However, the 2001 surveys yielded an apparent absence of Mohave ground squirrels and after consultations with CDFW, trapping grids were extended further south, with some located beyond the project area. This was done in an attempt to locate the nearest Mohave ground squirrel population. As a result, three new areas located south of the LA Aqueduct Bridge (No. 48-10), east of Hwy 395, and west of the Haiwee Reservoir were included as new trapping grids (Grids 13-15).

During the first trapping session in 2002, trapping was carried out on grids 1-4, 6, 7, 10, 13, 14, and 15, between March 26 and April 5. The second trapping session was between May 6-17, 2002 and included grids 1-10.

For additional information on the trapping efforts (type, size and spacing of traps within grids, bait and weather conditions), refer to the Caltrans NES, dated 2010.

2.3.4.7. General Wildlife Surveys

Wildlife observations were recorded during the course of all surveys conducted for each of the proposed alternatives mentioned in this report. A complete list of all wildlife species observed within the BSA is included in Appendix C.

2.3.4.8. Geotechnical Clearance Surveys

On May 1-2, 2013 clearance surveys were conducted for a pre-project geotechnical bore that was to be completed at five locations within the designated soil borrow site. The surveys included slowly driving access roads, when possible and walking from existing access routes to the locations of the five proposed bore locations. The clearance surveys were conducted for the Mohave ground squirrel, desert tortoise, burrowing owl, American badger, mule deer, desert kit fox, migratory nesting birds, indigo bush, Joshua tree and all species of cactus, within an approximate 500-foot zone of the locations of the proposed geotechnical activities. The foot surveys further included locating and flagging the best (path of least environmental impact to the potential species described above) potential off-road vehicle access routes for the bore rig. The burrowing owl surveys were conducted according to the *Burrowing Owl*

Survey Protocol and Mitigation Guidelines (The California Burrowing Owl Consortium 1993).

2.3.5. Personnel and Survey Dates

Table 3 below, chronologically lists all of the biological surveys conducted for the project that pertain to the selected 4-3 Hybrid, and includes the survey dates and personnel involved.

Table 3. Personnel and Survey Dates

Survey Description	Date	Personnel
Swainson's Hawk	March 18 & 24, 2001	Thomas Kucera (ESRP biologist)
Mohave Ground Squirrel	April 1-13 & May 6-18, 2001 and March 26-April 5 & May 6-17, 2002	Phil Leitner, Thomas Kucera, Patrick Kelly, Sean Avent, Tiffanie Brown, Howard Clark, Adam Harpster, Noriko Kawamoto, Kim Kreitenger, Brita Larsson, Matt Llyod, Steve Messer, Patrick Morrison, Darren Newman, Henning Schreiber, Debbie Smith, Foung Vang (ESRP biologists)
Botanical	April 16-20, 23-27 & 30-May 4, 2001	Ellen Cypher, Russell Kokx, Karen Dulik, Justine Smith-Kokx, John Silvas (ESRP biologists)
Bats	May 15-16 and October 8-9, 2001	Patrick Kelly, Wendy Philpott, Daniel Williams (ESRP biologists)
Informal Botanical	June 4-8, 2001 and March 1, 22, April 7 and May 3-4, 2002	Ellen Cypher, Russell, Kokx, Justine Smit-Kokx (ESRP biologists)
Nocturnal Small Mammal	October 8-11, 2001	Daniel Williams, Patrick Kelly, Thomas Kucera, Adam Harpster, Steve Messer, Darren Newman (ESRP biologists)
Desert Tortoise	June 20-22, 2001	Alice Karl, Thomas Kucera, Steve Boland, Gilbert Goodlet, Peggy Wood, Erich Green, David Roddy, Mercy Vaughn
Botanical	April 7-11, 21-26 and June 2-6, 2008	Jon Claxton, Travis Belt, Barret Holland (SWCA biologists)
Reconnaissance	March 24, 2009	Keri O'Connor (Caltrans biologist), Theresa Stevens (USACE)
Wetlands & Waters of the U.S.	April 26-May 6, 2009	Jan Novak, Galen Peracca, Jessie Golding, Katherine Caldwell, Ivan Parr, and Fletcher Halliday (URS biologists)
Habitat Assessment for southwestern willow flycatcher and least Bell's vireo	October 3, 2012	Jaimee Cornwell (Caltrans biologist), Ronald Cummings (URS biologist)
Desert tortoise	October 22-26 & 28-November 2, 2012	Brad Haley, Josh Corrona-Bennett, Kristin Mobraaten, Benjamin Smith, Wendy Turner, Terrance Wroblewski (ECORP biologists)
Habitat Assessment for southwestern willow flycatcher and least Bell's vireo	February 6, 2013	Jenny Richardson (Caltrans biologist)
Pre-clearance: wildlife and sensitive plant	May 1-2, 2013	Jaimee Cornwell (Caltrans biologist), Angela Gallardo (URS biologist)
Informal Botanical	May 24, 2013	Jaimee Cornwell (Caltrans biologist)

2.4. Agency Coordination and Professional Contacts

A record of agency coordination conducted during the course of environmental studies for the selected 4-3 Hybrid is presented below in chronological order.

June, 2003: An official list of federally- endangered and threatened wildlife and plant species that may be affected by the proposed project was obtained from the USFWS Ventura Office. The list was also updated in March, 2010 and December, 2012.

March 24, 2009: a field site visit was made with USACE liaison, Theresa Stevens, to review potentially jurisdictional wetlands and WOUS within the proposed alternatives on the project site.

December 3, 2009: a wetland and WOUS delineation report was submitted to the USACE for verification.

November, 2012: Caltrans initiated informal consultation with the USFWS to discuss avoidance and minimization measures for the federally- and state-threatened desert tortoise (*Gopherus agassizii*). Informal consultation was initiated with regard to a pre-project geotechnical bore, originally scheduled for December, 2012.

December 18, 2012: Sensitive species lists were obtained from the CNDDB and CNPS for the Bartlett, Cirque Peak, Coso Junction, Haiwee Pass, Haiwee Reservoirs, Lone Pine, Long Canyon, Monache Mountain, Olancha, Owens Lake, Templeton Mountain, Upper Centennial Flat and Vermillion Canyon USGS 7.5-Minute Topographical Quadrangles.

January 7, 2013: Caltrans biologist Jaimee Cornwell contacted (by phone) USFWS biologist Erin Nordin to discuss the potential on-site habitat for the Owens tui chub. Ms. Nordin agreed that potential habitat is likely to be present within the project site, but that it is unlikely any Owens tui chub are present within the project site. Ms. Nordin additionally suggested that Ms. Cornwell contact California Department of Fish and Wildlife (CDFW) ichthyologist Steve Parmenter to further discuss the potential for Owens tui chub within the project site.

January 9, 2013: Jaimee Cornwell contacted (by electronic mail (email)) Steve Parmenter, to get additional information on the current distribution of Owens tui chub and Owen’s Valley pupfish.

January 10, 2013: Steve replied (via email) that he didn't know of any records of Owen's pupfish in the project area. He also informed Ms. Cornwell that there was a population of Owens tui chub at the Cabin Bar Ranch (which extends through a portion of the project site, just south of Cartago) in 2002, but he has not had the opportunity to survey since that time to confirm their continued presence.

January 11, 2013: Ms. Cornwell contacted CDFW biologist James Erdman (via email) regarding the potential for the Sierra Nevada yellow-legged frog on the project site. This inquiry was based on conflicting information regarding the low end of the frogs' elevation range. Mr. Erdman replied, stating the lowest elevation that a population of Sierra Nevada yellow-legged frogs has been observed on the east side of the Sierra was approximately 6,600 feet. He further indicated that based on data from an ongoing project in the eastern Sierra for the past twelve years, he is unaware of any occurrences of the Sierra Nevada yellow-legged frog in the vicinity of Olancha or Cartago.

January 14, 2013: Phone conversation between Mr. Parmenter and Ms. Cornwell discussing the possibility of Owens tui chub to occur on the project site. Steve indicated there are no perennial waters to support Owens tui chub except a segment of Olancha Creek, located approximately a few hundred feet east of Hwy 395. Ms. Cornwell suggested that she provide a map of the location of the selected alignment (4-3 Hybrid) and a map of the Cabin Bar Ranch boundaries for Steve to review. Steve agreed to look at the maps and send an email for the project file.

January 14, 2013: Mr. Parmenter sent an email confirming that due to the location of the 4-3 Hybrid, there is not any suitable habitat within the project site to support the presence of Owens tui chub.

January 15, 2013: Ms. Cornwell contacted (by phone) Ms. Nordin regarding the possibility for presence of the southwestern willow flycatcher along Olancha Creek within the project boundaries. Ms. Cornwell suggested that based on in-office research and a site visit to assess the available habitat, on October 10, 2012, it did not appear the site contained sufficient habitat for nesting, but possibly for foraging and/or migrating. Ms Nordin commented on the difficulty of identifying the bird to species in the field and recommended that CDFW Acting Habitat Conservation Supervisor, Debra Hawk, be contacted for additional information.

January 15, 2013: Ms. Cornwell contacted Ms. Debra Hawk by phone. Ms. Hawk agreed that the habitat along Olancha Creek is unlikely to support nesting southwestern willow flycatchers, but that it is possible the species may use the area for foraging and/or migratory activities. Ms. Hawk recommended that any pre-construction surveys for the flycatcher be timed appropriately so as to be considered “focused” surveys, which would prevent Caltrans from having to mitigate unnecessarily if birds are not present. She also recommended that, if possible, construction be timed during the non-breeding season to avoid any potential impacts to the birds. Ms. Cornwell relayed that Caltrans is considering inferring presence for this species and providing subsequent mitigation for minimal impacts. Ms. Hawk agreed with this approach and reminded that Caltrans would need a 2080.1 Incidental Take Permit. Ms. Hawk suggested that Caltrans use the CDFW-approved mitigation bank in Kern County; although; she did not specify the name of the bank.

January 17, 2013: Mr. James Erdman sent an email to Ms. Cornwell confirming that based on the maps Ms. Cornwell provided to Mr. Parmenter, and previous information exchanged via emails, he felt it would be safe to rule out the presence of the Sierra Nevada yellow-legged frog. He further stated that he felt confident that any dedicated surveys for the frogs would yield negative results, and that they are not present within the project site.

January 30, 2013: Ms. Cornwell contacted Ms. Nordin (through email) to discuss the potential for the least Bell’s vireo along Olancha Creek. Ms. Nordin indicated that USFWS still includes the vireo on their species list because the species historically occurred in Olancha. Ms. Nordin further stated that unless there has been a project in the area, and the species has been surveyed for recently, the USFWS does not have recent information to indicate presence or absence. Ms. Nordin suggested Ms. Cornwell contact CDFW or a local bird watching group to obtain more recent information on the potential presence of this species.

January 31, 2013: Ms. Cornwell and Ms. Nordin corresponded through email about Caltrans inferring presence for the southwestern willow flycatcher; Ms. Nordin indicated that it would be fine with USFWS if Caltrans were to do so. She then suggested that Caltrans decide what measures would be implemented to minimize and avoid take of the flycatcher and that when mitigation is being determined, ongoing impacts to the birds (resulting from continuous traffic noise) should be considered. Ms. Nordin further emphasized the importance of providing avoidance measures during construction for any nesting migratory birds. Ms. Nordin additionally mentioned the necessity for considering both direct and indirect impacts to the desert tortoise and recommended that Caltrans provide undercrossings and permanent fencing as minimization and mitigation measures.

January 31, 2013: Ms. Cornwell contacted (by phone) Mr. John Heindel of the Eastern Sierra Audubon Society to discuss the potential for the least Bell’s vireo to be present on, or near the project site. John relayed that no least Bell’s vireo have been documented in Olancha for at least fifty years. He further stated that their presence has not been documented in Lone Pine or Bishop either. John mentioned that due to cowbird trapping efforts in southern California, the species range is expanding. John said that he and his wife (both are long-time birders who reside in Lone Pine, CA) use BLM data, university data, as well as other available scientific data, but that he has not seen any (recent) data compiled for the least Bell’s vireo near Olancha.

February 1, 2013: Ms. Cornwell contacted Caltrans District 9 biologist, Mrs. Jenny Richardson, to speak about the potential for the southwestern willow flycatcher and the least Bell’s vireo along Olancha Creek. Mrs. Richardson provided Ms. Cornwell with contact information for some bird specialists located in the Owens Valley. Ms. Cornwell and Mrs. Richardson also discussed the idea of Mrs. Richardson making a site visit to Olancha Creek to assess the potential for southwestern willow flycatcher habitat, due to her previous experience surveying for the species.

February 5, 2013: Ms. Cornwell emailed Mr. Jonathan Dunn, an expert birder and local in Inyo County, to see if he had any recent information on the least Bell’s vireo in Inyo County. Mr. Dunn told Ms. Cornwell that he had not personally seen any least Bell’s vireo in Inyo County, aside from the China Creek Ranch (east of Tecopa) and once at the Furnace Creek Ranch in Death Valley National Park. He said he knew of one bird that was present for two consecutive summers along the Owens River just east of Big Pine, but then pointed out that the species is still extremely rare in Kern County, but that perhaps as the species recovers in southern California, there will be more birds. Mr. Dunn also mentioned that the subspecies identity (*arizonae* or *pusillus*) of the birds observed at the China Creek Ranch is open to question.

February 7, 2013: Mrs. Richardson emailed Ms. Cornwell to provide the results of her habitat assessment at the location of the new alignment crossing at Olancha Creek. Mrs. Richardson relayed that she agreed with Ms. Cornwell’s assessment, that the segment of habitat to be impacted is marginal at best. Mrs. Richardson noted that she looked at the habitat along the creek both upstream and downstream from the project site and did observe what she would consider to be suitable nesting habitat for the southwestern willow flycatcher, but not within or immediately adjacent to the project area. Mrs. Richardson commented that because potentially suitable nesting habitat for the southwestern willow flycatcher is present along the creek, it is possible that the species could use the segment to be impacted for foraging or during migration.

February 8, 2013: Ms. Cornwell contacted (by email) Ms. Debbie House, the Watershed Resource Specialist at the Los Angeles Department of Water and Power. Ms. Cornwell asked Ms. House if she would provide her assessment on the potential for southwestern willow flycatcher habitat along Olancha Creek and also asked if Ms. House knew of any recent documented occurrence data for least Bell's vireo in the vicinity of the project site. Ms. House stated that the minimum width for nesting habitat for the southwestern willow flycatcher is 10 meters (approximately 33 feet), as described in the *Southwestern Willow Flycatcher Recovery Plan*. Ms. House relayed she had measured the width of the creek, using high resolution aerial imagery, and that the creek averaged less than 10 meters in width; she further stated that based on width alone, a case could probably be made that suitable nesting habitat is not present. Ms. House commented that the habitat does not look like least Bell's vireo habitat either and that the species is typically found in wide active floodplain habitats. Ms. House went on to mention that the only nesting Bell's vireo that she has known of are in the Tecopa area (of southeast Inyo County), as well as an additional pair that she documented a few years ago who only nested for one year on the Owens River near Big Pine. Ms. House finished by stating the potential for least Bell's vireo in the project area is pretty limited and that she would not worry about this species occurring in the project area.

February 11, 2013: Ms. Nordin provided information on desert tortoise undercrossings and permanent fencing via an email to Ms. Cornwell.

February 15, 2013: Ms. Cornwell verified (during a phone conversation) with Tom Stephenson, CDFW biologist, that there are no concerns over the project with respect to the Sierra Nevada bighorn sheep.

February 20, 2013: Ms. Cornwell contacted (via email) Debra Hawk to determine if Caltrans were to implement avoidance and minimization measures for desert tortoise (undercrossings at one-mile intervals, permanent tortoise fencing and cattle guards with tortoise escape ramps at access roads), to protect the existing population within the project site, if CDFW would be willing to negotiate on the ratios that would be required for off-site land replacement used to mitigate for permanent and temporary impacts to the on-site habitat. Ms. Cornwell also relayed that Caltrans would be inferring migratory presence for the southwestern willow flycatcher and that Caltrans is making the determination that the proposed project “may affect, but is not likely to adversely affect” the species. Ms. Cornwell included that the proposed mitigation for impacts to migratory habitat would be accomplished through 2:1 and 1:1 replacement ratios for permanent and temporary impacts to habitat, respectively. It was also mentioned that Caltrans is planning to install some native tree and shrub plantings along the outer edge of the Caltrans RoW, at the Olancha Creek crossing, to provide a visual and audio buffer to the species, and other wildlife, to off-set cumulative impacts resulting from the presence of traffic. Ms. Cornwell further mentioned that Caltrans plans to have an on-site monitor during construction if any southwestern willow flycatcher’ are observed during the pre-construction surveys.

February 25, 2013: Ms. Hawk replied to Ms. Cornwell’s inquiry, regarding the potential for reduced land replacement ratios due to the on-site avoidance and minimization measures being proposed. Ms. Hawk stated that at this time CDFW does not have a policy for mitigation “credit” with regard to land replacement ratios. Ms. Hawk indicated that mitigation ratios and avoidance/minimization measures are typically worked out during the processing of the application for an Incidental Take Permit, and that to try to negotiate those details at this time was contrary to CDFW’s process.

February 25, 2013: Ms. Nordin provided specifications and photographs of a tortoise-modified cattle guard via email. Ms. Nordin relayed that it is advisable to locate tortoise undercrossings in washes as much as possible. Previously Caltrans inquired about the possibility of only installing permanent tortoise fencing in areas where recent tortoise occurrences are concentrated (for example, the area on the north side of Olancha Creek and the area just north of the southern project terminus). Ms. Nordin responded to this inquiry, commenting that she was not able to determine if the permanent tortoise fencing could be justifiably eliminated from the northern portions of the project site (based on a lack of recent tortoise occurrence data) at this time and that she would need to review the tortoise report results in their entirety prior to making that decision.

February 25, 2013: Ms. Cornwell contacted (by email) Robert McMorran, a southwestern willow flycatcher Specialist at USFWS, per recommendation by Erin Nordin. Ms. Cornwell relayed that Caltrans is proposing 2:1 and 1:1 off-site land replacement ratios for permanent and temporary impacts to migratory habitat, respectively, as well as the proposed installation of native tree and shrub plantings within the outer extent of the Caltrans RoW at the Olancha Creek crossing. Ms. Cornwell asked for any feedback that Mr. McMorran could provide on these ideas as well as the name of a mitigation bank that could be used for land replacement in the project vicinity.

February 27, 2013: Ms. Cornwell phoned Heidi Sickler, CDFW biologist, to further discuss the potential for getting USFWS and CDFW "on-board" together regarding the on-site avoidance and minimization being proposed for the desert tortoise. Heidi agreed to discuss the proposal with other biologists at CDFW, who specialize in desert tortoise, in order to get feedback on the effectiveness of the proposal.

March 1, 2013: Mr. McMorran replied (via email) to Ms. Cornwell's inquiry regarding mitigation ratios for the southwestern willow flycatcher, stating that he thought the proposed ratios for off-site land replacement, and the on-site native plantings, sounded like a great approach to mitigating for the on-site migratory habitat. Mr. McMorran suggested that Caltrans also include some language (in the mitigation proposal) that would provide for the permanent protection/conservation of the on-site native plantings. Mr. McMorran indicated that he was not aware of any mitigation banks for the southwestern willow flycatcher in Inyo County, but offered to look into it and get back to Ms. Cornwell if anything turned up.

March 1, 2013: Ms. Cornwell contacted (by email) Caltrans District 9 Maintenance Engineer, Brad Larsen, to obtain contact information for maintenance workers who have experience with monitoring and maintaining permanent tortoise- fencing, undercrossings and cattle guards. Ms. Cornwell was hoping to get feedback from those with experience with the aforementioned tortoise-protective installations to determine the long-term feasibility of the proposed on-site avoidance/protective measures.

March 5, 2013: Mr. Larsen provided Ms. Cornwell with contact information for a number of Caltrans employees with possible experience with the tortoise-protective installations being considered for the proposed project.

March 6, 2013: Ms. Cornwell phoned the Inyokern Caltrans Acting Supervisor, Marty McNamara, to discuss his experience with monitoring and maintaining permanent tortoise fencing and undercrossings. Mr. McNamara indicated that the most common and labor-intensive "problem" associated with maintaining the permanent tortoise fencing is providing repairs to gaps created under the fencing resulting from flash flooding in locations without culverts, which causes water runoff to sheet-flow overland, thereby washing out the soils along the fence line. Mr. McNamara indicated that if culverts were appropriately installed at common waterways, and tortoise fencing was secured to appropriately adjoin to the culverts, maintaining the permanent fencing would be much easier.

March 6, 2013: Ms. Cornwell contacted (by phone) Mr. Mahmoud Sadeghi, Senior Caltrans Biologist in District 8, to discuss maintenance for permanent tortoise fencing and undercrossings. Mr. Sadeghi relayed that desert washes are the problem areas. He emphasized the need for monitoring after flash floods. He also mentioned that trash and debris can collect along fencing and, if not removed, it can provide a “ramp,” allowing tortoise to get out onto the highway. Mr. Sadeghi also emphasized the importance of routine cleanings of the inlet/outlet(s) within tortoise undercrossings. He explained that Russian thistle (*Salsola tragus*) could block the passageway through the undercrossing. He also commented that the soil bottom, that is necessary for tortoise within the undercrossings, could wash out, thus creating a “lip” between the ground surface and the floor of the undercrossing, which could act as a barrier to juvenile tortoise. Mr. Sadeghi recommended that if the permanent fencing and undercrossings are installed, a request for a consultant contract or for a superintendent to maintain the undercrossings should be initiated. Mr. Sadeghi additionally recommended that riprap covered with sand and gravel be placed in the bottom of the undercrossings, as the combination is easier to maintain than just placing soil alone. He also suggested that a 3:1 replacement ratio is standard for permanent impacts within desert tortoise Critical Habitat, but that land replacement ratios are generally 1:1 in areas outside of designated Critical Habitat. Mr. Sadeghi informed Ms. Cornwell that in District 8, Caltrans has hired two biologists exclusively for monitoring and maintenance of tortoise-protective installations.

March 6, 2013: Ms. Sickler (CDFW) responded (via email) to Ms. Cornwell that although the installation of tortoise undercrossings, permanent fencing and cattle guards may be of benefit to the on-site population of tortoise, at this time, CDFW has no way to accept avoidance/minimization measures towards the off-site compensatory mitigation requirement. Ms. Sickler further mentioned that there is no policy to reduce land replacement ratios in the CESA process and that currently this policy requires projects to be ‘fully mitigated.’ She also suggested that Ms. Cornwell not be premature by including overly detailed minimization/avoidance measures in the Biological Assessment and that it might be more appropriate to specify those details during the CESA Incidental Take Permit application process. She further suggested that down the road there could be different CDFW policies that could allow for negotiation of land replacement ratios, which may apply to the current project depending on the timing of its construction.

June 10, 2013: Formal consultation with the USFWS was initiated by and FHWA through the submission of a Biological Assessment which specifically addressed the federally- and state-threatened desert tortoise and its presence within the proposed project site, as well as all other federally-listed species of plant and animal with a potential to occur on the project site.

July 23, 2013: the USFWS responded FHWA’s request to initiate formal consultation with a letter that deemed the application was incomplete and that outlined specific questions and requests for additional information.

September 23, 2013: FHWA submitted a response letter to the USFWS that answered their questions and provided additional information on the project, as requested in their letter, dated July 23, 2013.

November 19, 2013: FHWA submitted a revised Biological Assessment, upon request of the USFWS, and the application was deemed complete, thus starting the 135-day review period, within which the USFWS would issue a Biological Opinion for the proposed project.

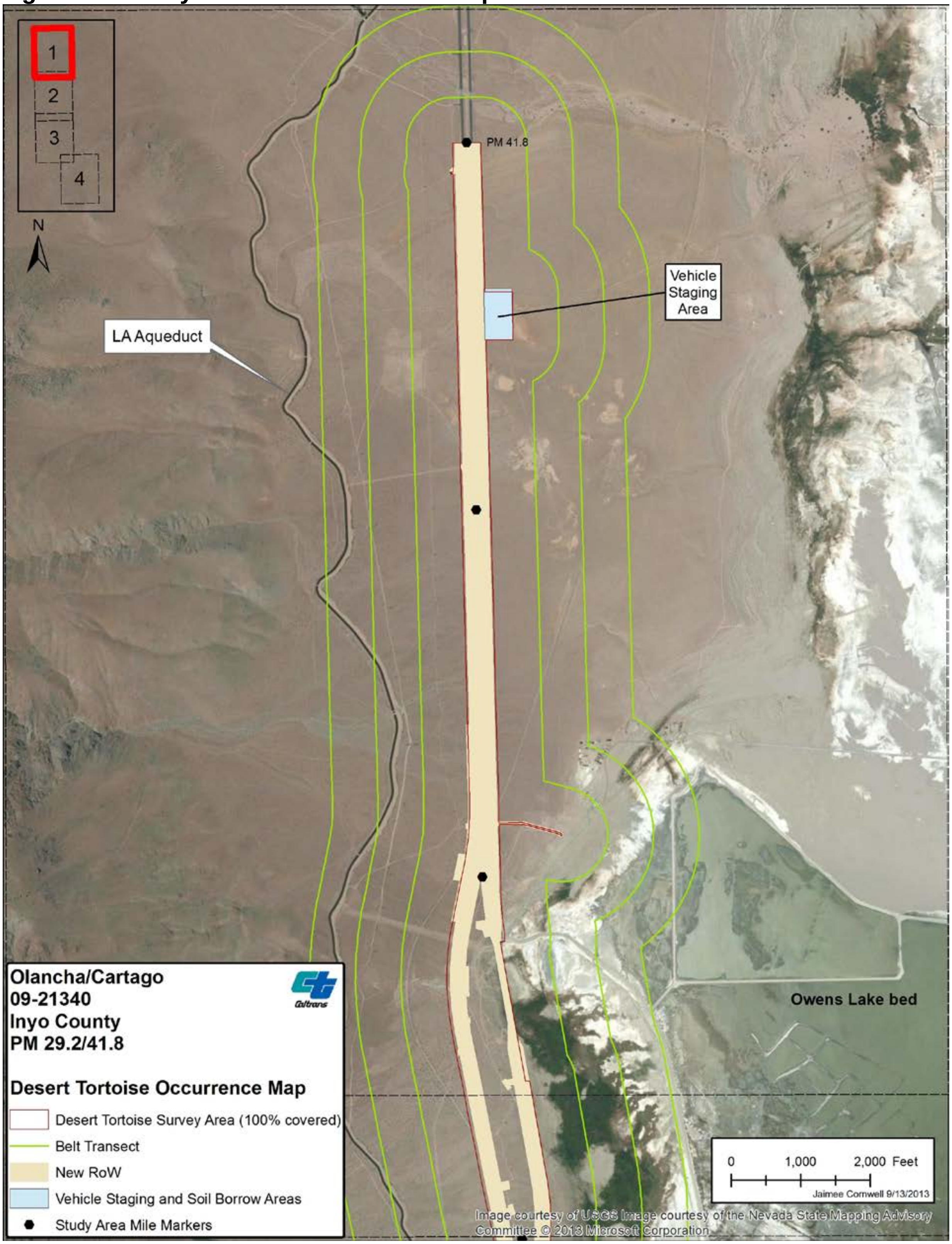
2.5. Limitations That May Influence Results

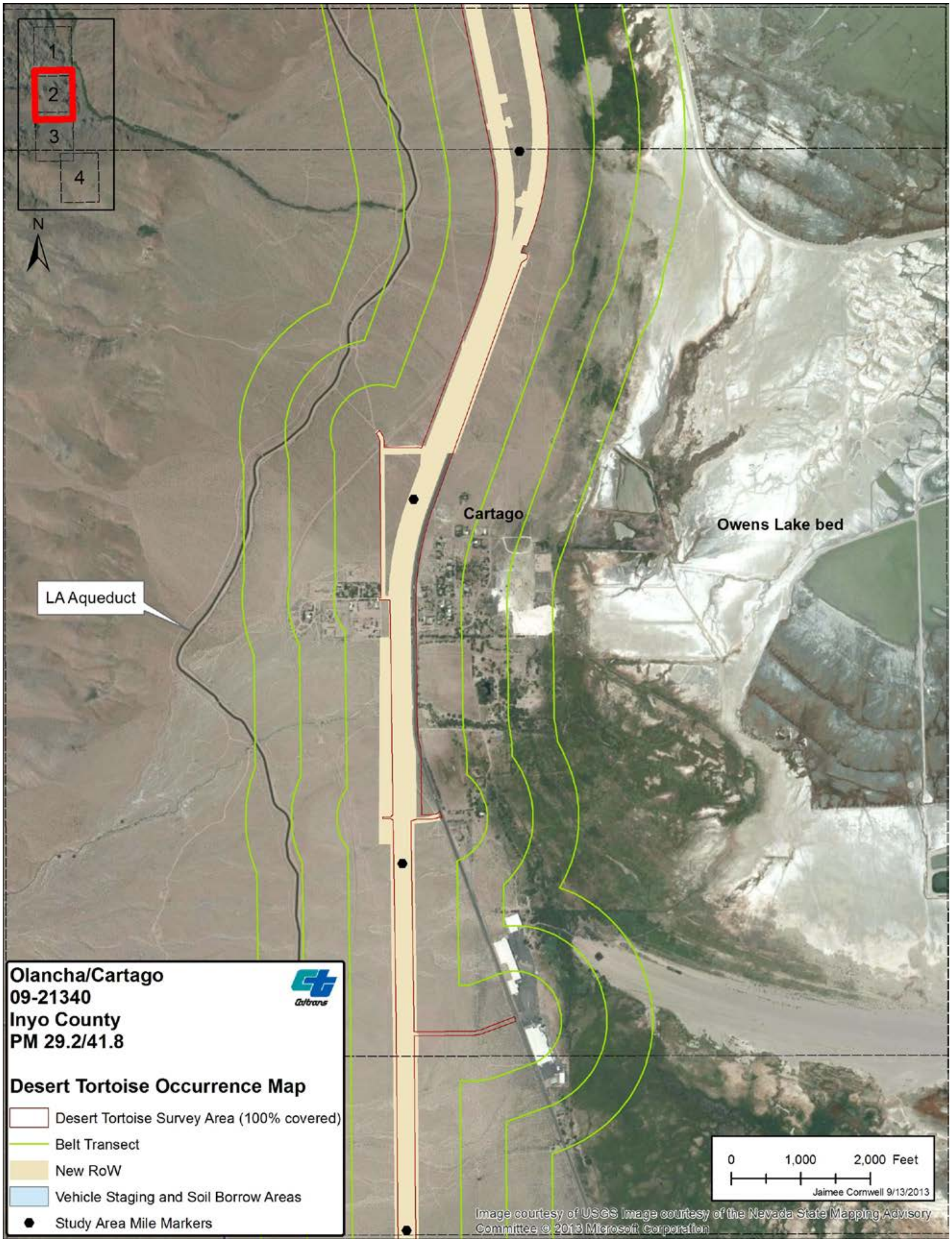
To date, Caltrans has not conducted focused surveys for the southwestern willow flycatcher. The inferred presence of southwestern willow flycatcher migration habitat was based on the results of on-site habitat assessments and in-office research (a thorough review of information obtained during phone and email correspondence with scientific professionals with a demonstrated knowledge of the target species, analysis of scientific articles and occurrence data from resource agencies, as well as the review of mapping and aerial photography). Likewise, Caltrans decision to rule out the potential presence of the least Bell’s vireo was based on determinations and conclusions resulting from habitat assessments and in-office research, using the same methodology as is described above for the southwestern willow flycatcher.

The PIA and new RoW were widened by approximately 10 to 20 feet, depending on the location, after the completion of the 2012 desert tortoise surveys; therefore, approximately 52.5 acres of potential tortoise habitat, currently located within the expanded new RoW, were not covered during the one hundred percent cover tortoise surveys. The 52.5 acres of un-surveyed potential tortoise habitat are located in areas that extend approximately 10 to 20 feet beyond those which were covered during the one hundred percent cover tortoise surveys. Please refer to Figure 4 which shows the areas covered during the 2012 desert tortoise surveys and the enlarged portions of the RoW, that were not covered during the surveys. It should be noted that pre-construction clearance surveys for the desert tortoise will be conducted throughout the PIA, RoW, soil borrow site and vehicle staging areas; therefore any tortoise sign that may have been missed as a result of changes to the limits of the RoW, will be located prior to project construction.

Additional protocol surveys for the Mohave ground squirrel were not conducted for Alternative 4, however the survey and impact areas are located within close proximity to the 4-3 Hybrid; therefore, the previous survey data can be used.

Figure 4: Survey Areas and New RoW Map

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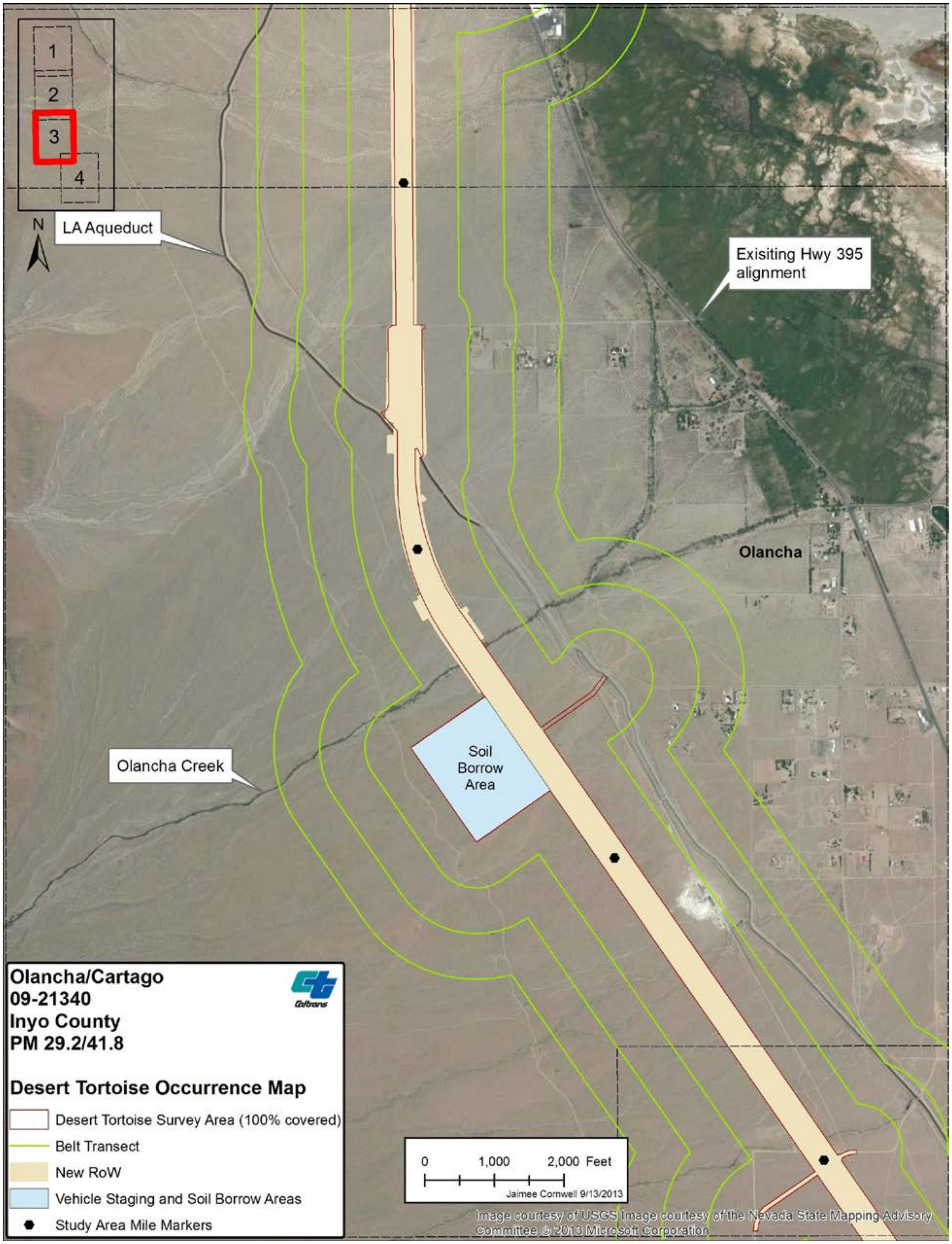
Owens Lake bed
LA Aqueduct
Olancha/Cartago
09-21340
Inyo County
PM 29.2/41.8
Desert Tortoise Occurrence Map
Desert Tortoise Survey Area (100% covered)
Belt Transect
New RoW
Vehicle Staging and Soil Borrow Areas
Study Area Mile Markers
0 1,000 2,000 Feet
Jaimee Cornwell 9/13/2013
Image courtesy of USGS Image courtesy of the Nevada State Mapping Advisory Committee © 2013 Microsoft Corporation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Exisiting Hwy 395 alignment
Olancha
Soil Borrow Area
Olancha Creek
Olancha/Cartago
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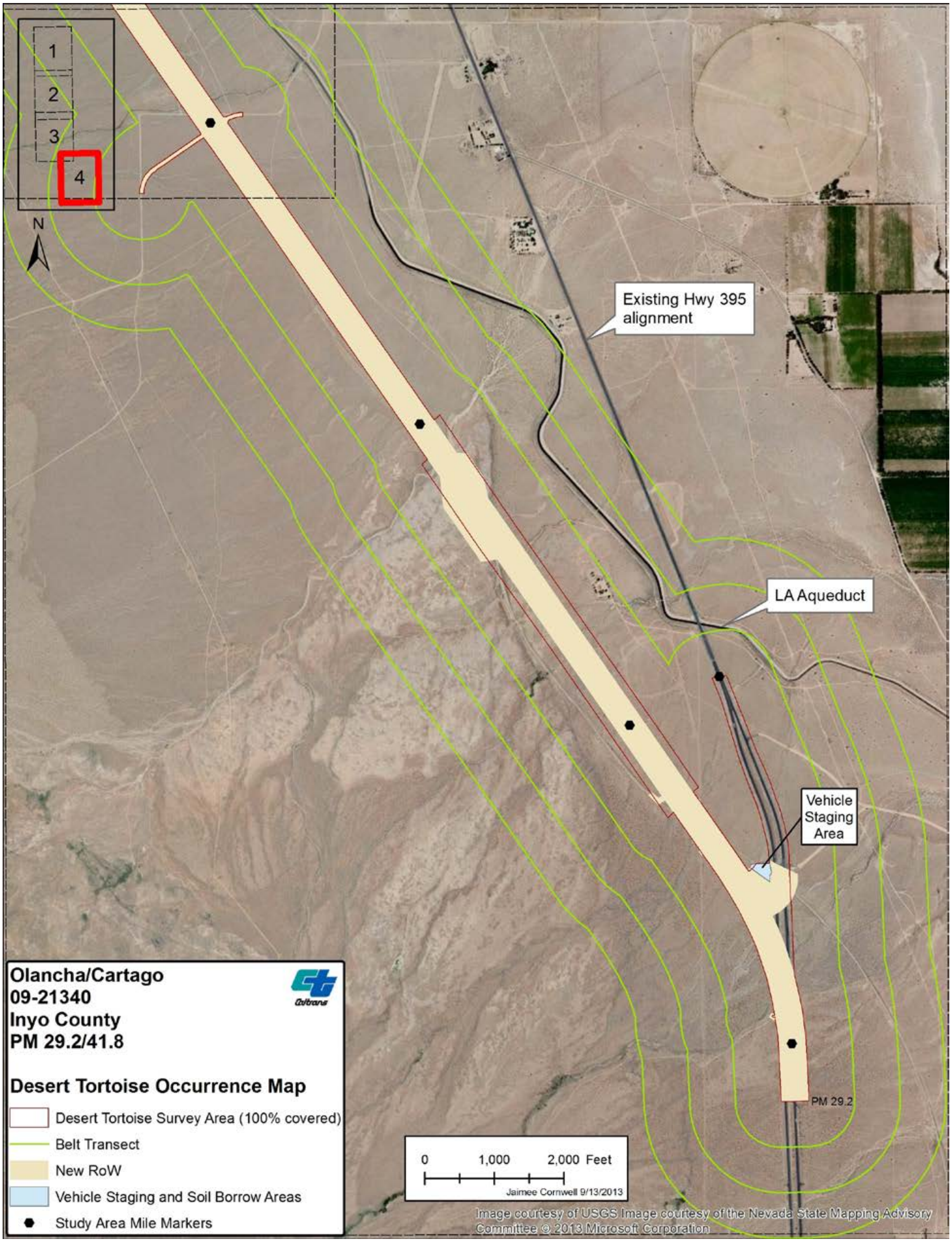
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Chapter 3. Results: Environmental Setting

The following section provides an evaluation of the environment where the proposed project occurs, including physical and climatic conditions, soil types, hydrologic resources, habitat, and species of wildlife observed within the BSA.

3.1. Existing Physical and Biological Conditions

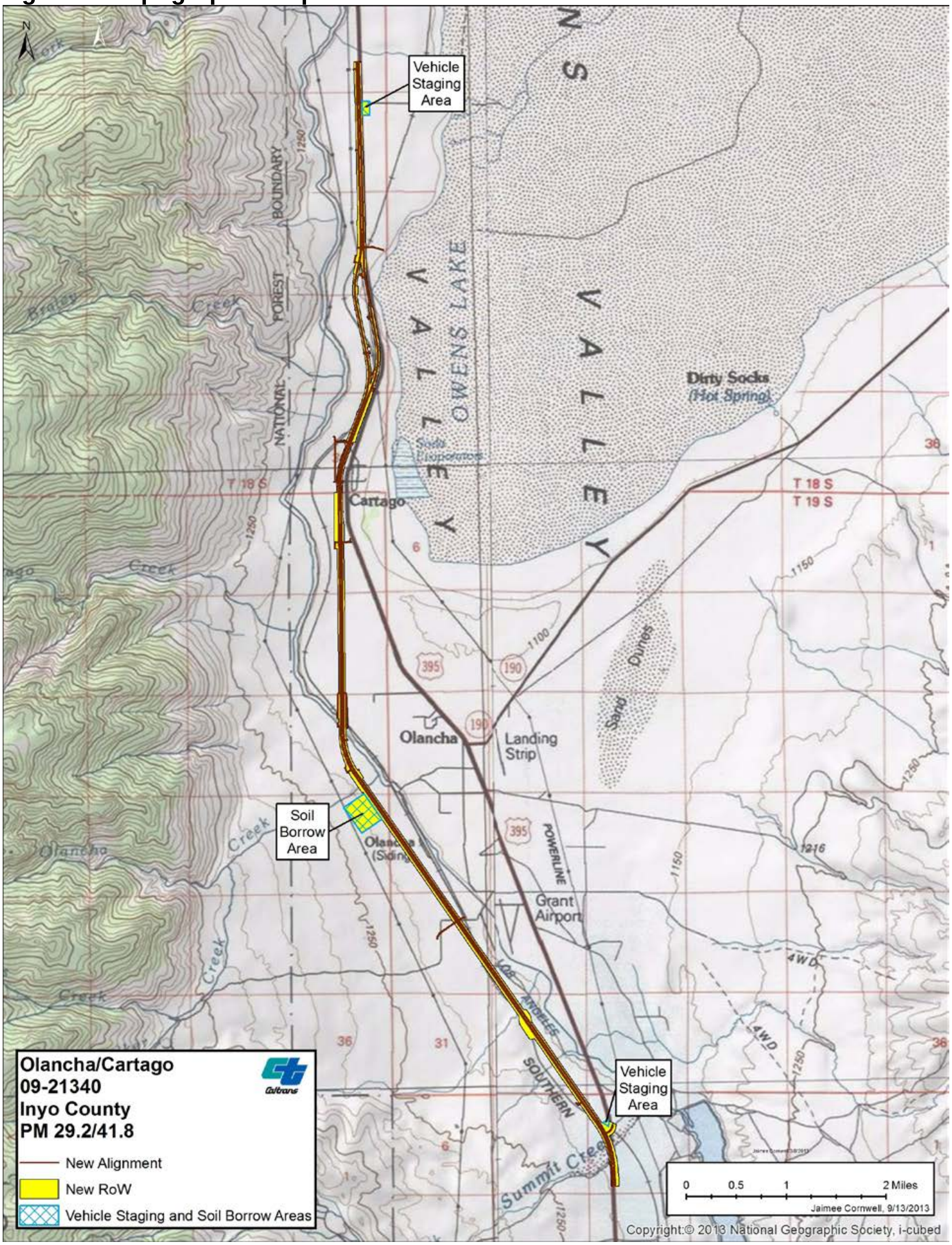
The proposed project site is located along Hwy 395 in the southwestern portion of Inyo County, California. As previously mentioned, the project extends from PM 29.2, located approximately 5.25 miles south of the town of Olancha at the southern end of the Owens Valley, to PM 41.8, approximately 4.5 miles north of the town of Cartago.

3.1.1. Physical Conditions

The topography in the project area is gently to moderately undulating with elevations ranging from approximately 3,600 to 3,980 feet above sea level (Figure 5). The western edge of the project site is relatively higher in elevation, based on its proximity to the base of the Sierra Nevada. The eastern extent of the project site is relatively lower in elevation and is partially bordered by the western edge of the Owens Lake bed. The project site is located within portions of the Bartlett, Olancha, Haiwee Pass and Haiwee Reservoirs U.S. Geological Survey (USGS) 7.5-minute quadrangle maps. The existing alignment and selected 4-3 Hybrid occupy portions of: Sections 12, 13, 24, 25 and 36 of Township 18 South, Range 36 East; Sections 1, 12, 13 and 24 of Township 19 South, Range 36 East; Sections 7, 18, 19, 20, 29, 30 and 32 of Township 19 South, Range 37 East; and Sections 4, 9 and 33 of Township 20 South, Range 37 East, of the Mt. Diablo Meridian.

The climate in the project site is classified as arid with hot, dry summers and cold winters. The average annual temperature is 56 degrees Fahrenheit; however, summer temperatures can reach 110 degrees Fahrenheit and winter temperatures can be as low as -8 degrees Fahrenheit. The average annual precipitation occurring on the valley floor is approximately 5 inches, which generally occurs during the winter months in the form of rain or snow (Western Regional Climate Center 2012).

Figure 5: Topographic Map



3.1.1.1. SOILS

The Natural Resource Conservation Service (NRCS) mapped the soils within the project site in the soil survey for the Benton-Owens Valley Area Parts of Inyo and Mono Counties, California (NRCS 2012). Soils in the southwestern portion of the project site have either not been surveyed or the survey data is not available online; therefore, those soils are not described in the table below. Please refer to Figure 6 for the locations of the mapped soils within the project site.

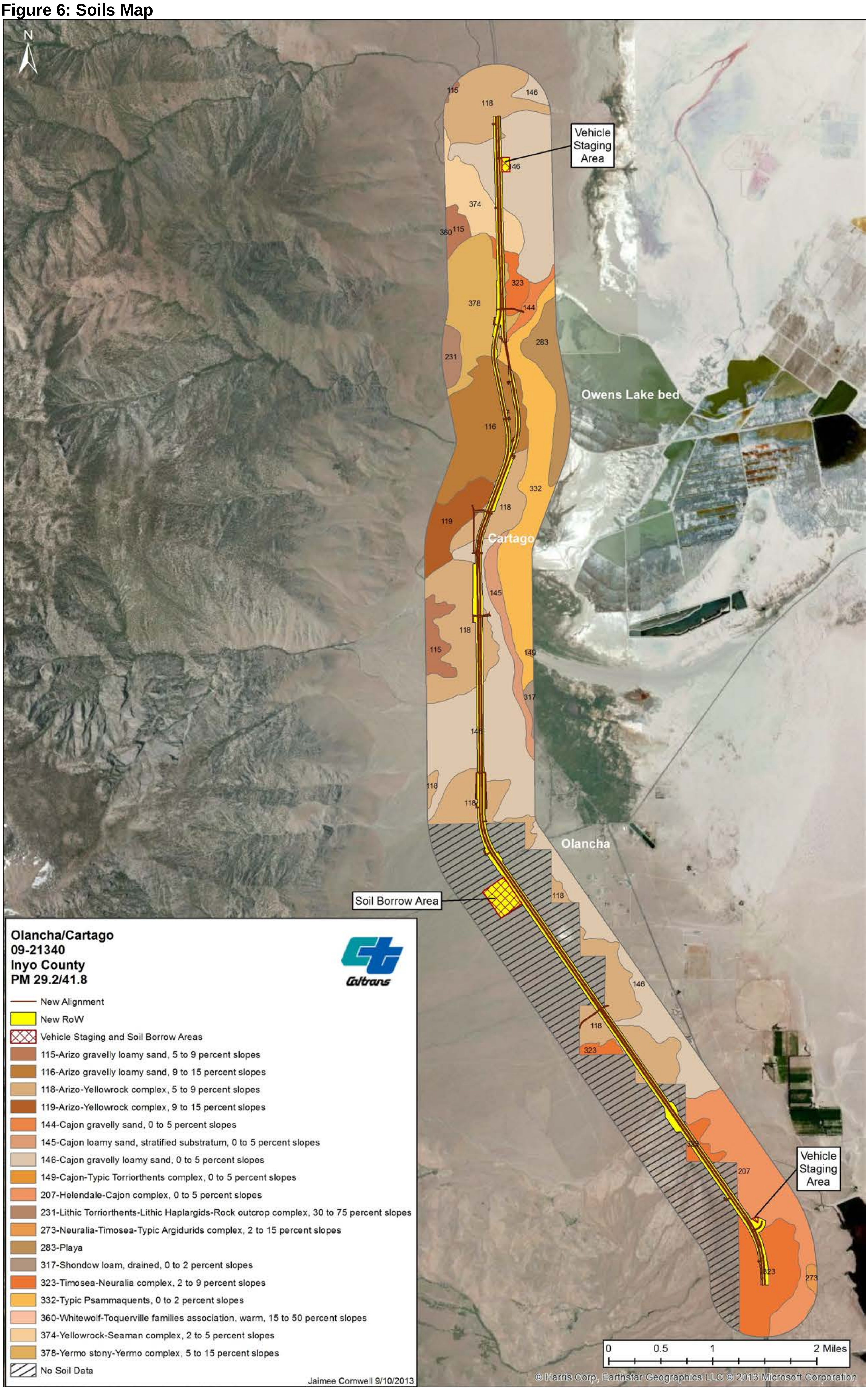
Table 4. Mapped Soils Within the Project Site

Map Unit Symbol	Map Unit Name	Percent Slope	Parent Material	Landform	Hydric
115	Arizo gravelly loamy sand	5-9	Alluvium derived from granite	Fan terraces and alluvial fans	No
116	Arizo gravelly loamy sand	9-15	Alluvium derived from granite	Fan terraces and alluvial fans	No
118	Arizo-Yellowrock complex	5-9	Alluvium derived from granite	Alluvial fans	No
119	Arizo-Yellowrock Complex	9-15	Alluvium derived from granite	Alluvial fans	No
144	Cajon gravelly sand	0-5	Alluvium derived from granite	Beach terraces	Yes
145	Cajon loamy sand, stratified substratum	0-5	Alluvium derived from granite	Inset fans	No
146	Cajon gravelly loamy sand	0-5	Alluvium derived from granite	Fan terraces and alluvial fans	No
149	Cajon-Typic Torriorthents complex	0-5	Alluvium derived from granite	Bars	No
207	Helendale-Cajon Complex	0-5	Alluvium derived from granite	Fan terraces	No

Map Unit Symbol	Map Unit Name	Percent Slope	Parent Material	Landform	Hydric
231	Lithic Toriorthents-Lithic Haplargids-Rock outcrop complex	30-75	Residiuum weathered from metavolcanics and/or metasedimentary rock and/or granite	Hills, mountains	No
273	Neuralia-Timosea-Typic Argidurids complex	2-15	Alluvium derived from granite	Fan terraces	No
283	Playa	0-2	Lacustrine deposits derived from mixed material	Playas	Yes
317	Shondow loam	0-2	Alluvium derived from mixed material	Fan terraces	Yes
323	Timosea-Neuralia complex	2-9	Alluvium derived from granite	Fan terraces	Yes
332	Typic Psammaquents	0-2	Alluvium derived from mixed sources and lacustrine deposits	Rims on playas	Yes
360	Whitewolf-Toqerville families association, warm	15-50	Colluvium derived from granite and/or residiuum weathered from granite	Hills	No
374	Yellowrock-Seaman complex	2-5	Alluvium derived from mixed material	Alluvial fans, fan terraces	No
378	Yermo stony-Yermo complex	5-15	Alluvium derived from mixed material	Fan terraces	Yes

Data obtained from the Benton-Owens Valley Area Parts of Inyo and Mono Counties, California (NRCS 2012).

Figure 6: Soils Map



3.1.1.2. HYDROLOGICAL RESOURCES

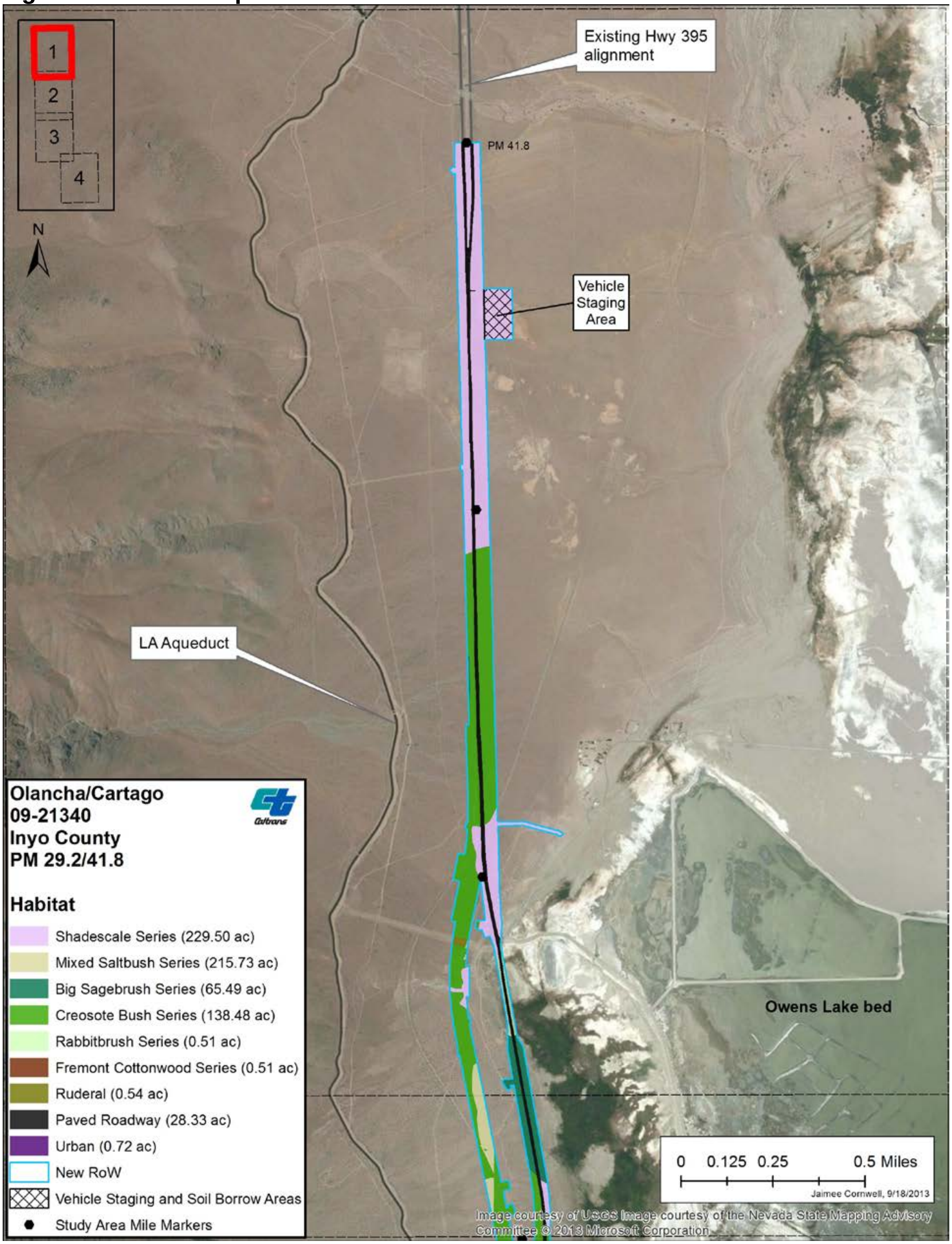
There are numerous hydrological features (wetlands, perennial and ephemeral drainages and large alluvial fans) within the BSA. The drainages and alluvial fans channel runoff from the Sierra Nevada, located west of the project site, eastward through the project site. The majority of these features no longer convey surface, or sub-surface, hydrology all the way to Owens Lake as they did historically. This is due to the development of the Aqueduct and installation of groundwater operational wells, both of which have affected hydrology in the Owens Valley and likewise contributed to the Owens Lake becoming a dry bed in the 1920's (URS 2009). At present time, the majority of hydrologic runoff that flows eastward from the Sierra Mountains is either diverted into the Aqueduct, or groundwater wells, to support the City of Los Angeles or to provide for local agriculture around the Owens Lake bed, respectively.

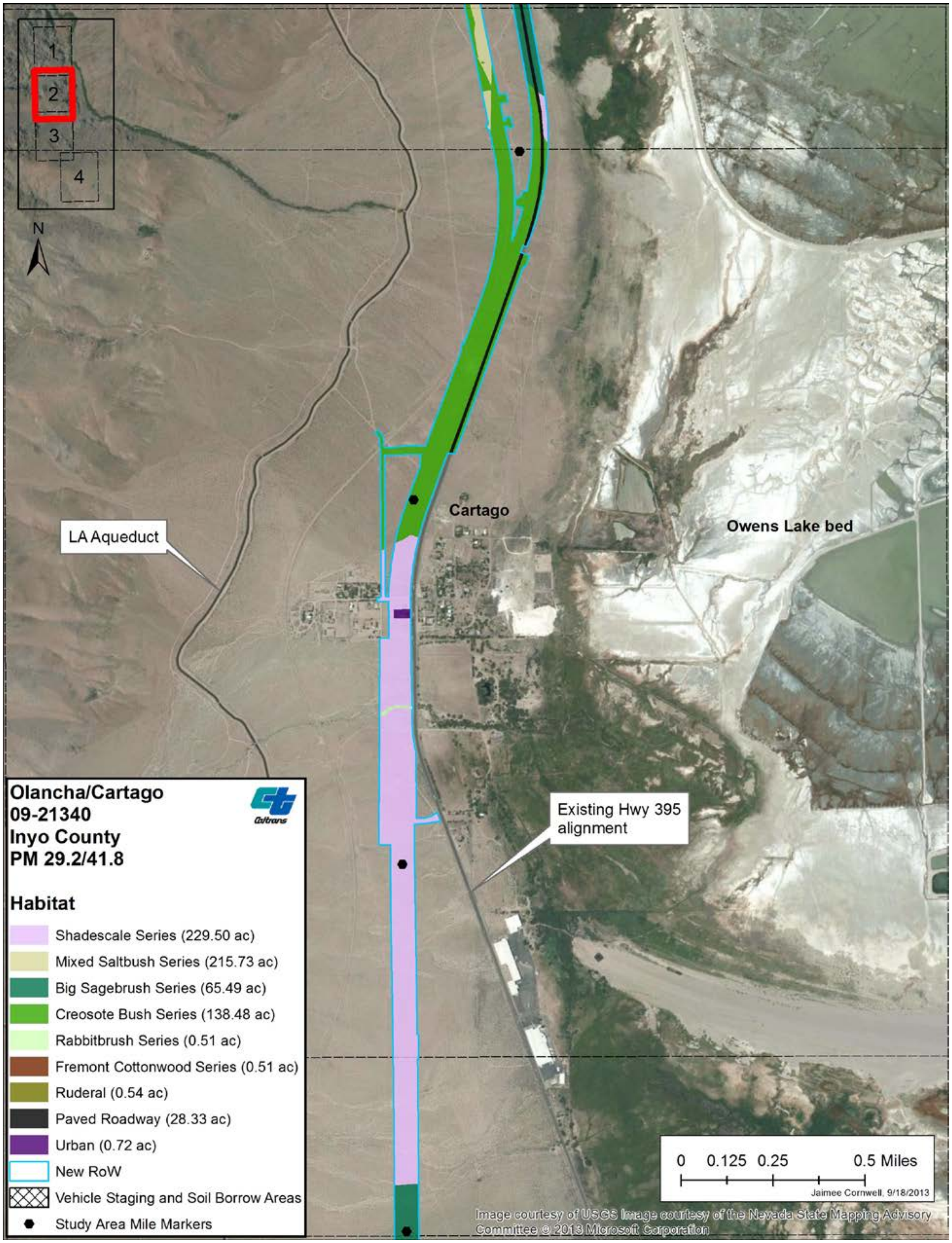
3.1.2. Habitat Types

To remain consistent with the botanical studies conducted for this project (Caltrans 2004 and SWCA 2008), vegetative communities within the BSA have been classified and mapped based on nomenclature defined by Sawyer and Keeler-Wolf (Figure 7; 1995). Equivalent vegetative community classifications, according to the CNDDB and Holland are presented in Appendix B of the original NES completed in June 2003.

Portions of the BSA and surrounding areas were previously impacted by historic and on-going activities associated with the installation and maintenance of the Aqueduct, fiber optic line, power transmission line and the Union Pacific Railroad. These areas are also used for grazing cattle. Therefore, the project site is comprised of both: previously disturbed lands with a higher presence of weedy species, and other areas which remain relatively undisturbed with very few weedy species, if any. Overall, the habitat within the proposed project site is of moderate to moderately high quality. A detailed assessment of the specific qualities of habitat within each of the following series' cannot be provided due to an absence of recent habitat observation and/or assessment data covering the entire 4-3 Hybrid; however, quality has been assumed lower in areas located in close proximity to the existing alignment.

Figure 7: Habitat Map

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Mixed Saltbush Series (215.73 ac)
Big Sagebrush Series (65.49 ac)
Creosote Bush Series (138.48 ac)
Rabbitbrush Series (0.51 ac)
Fremont Cottonwood Series (0.51 ac)
Ruderal (0.54 ac)
Paved Roadway (28.33 ac)
Urban (0.72 ac)
New RoW
Vehicle Staging and Soil Borrow Areas
Study Area Mile Markers
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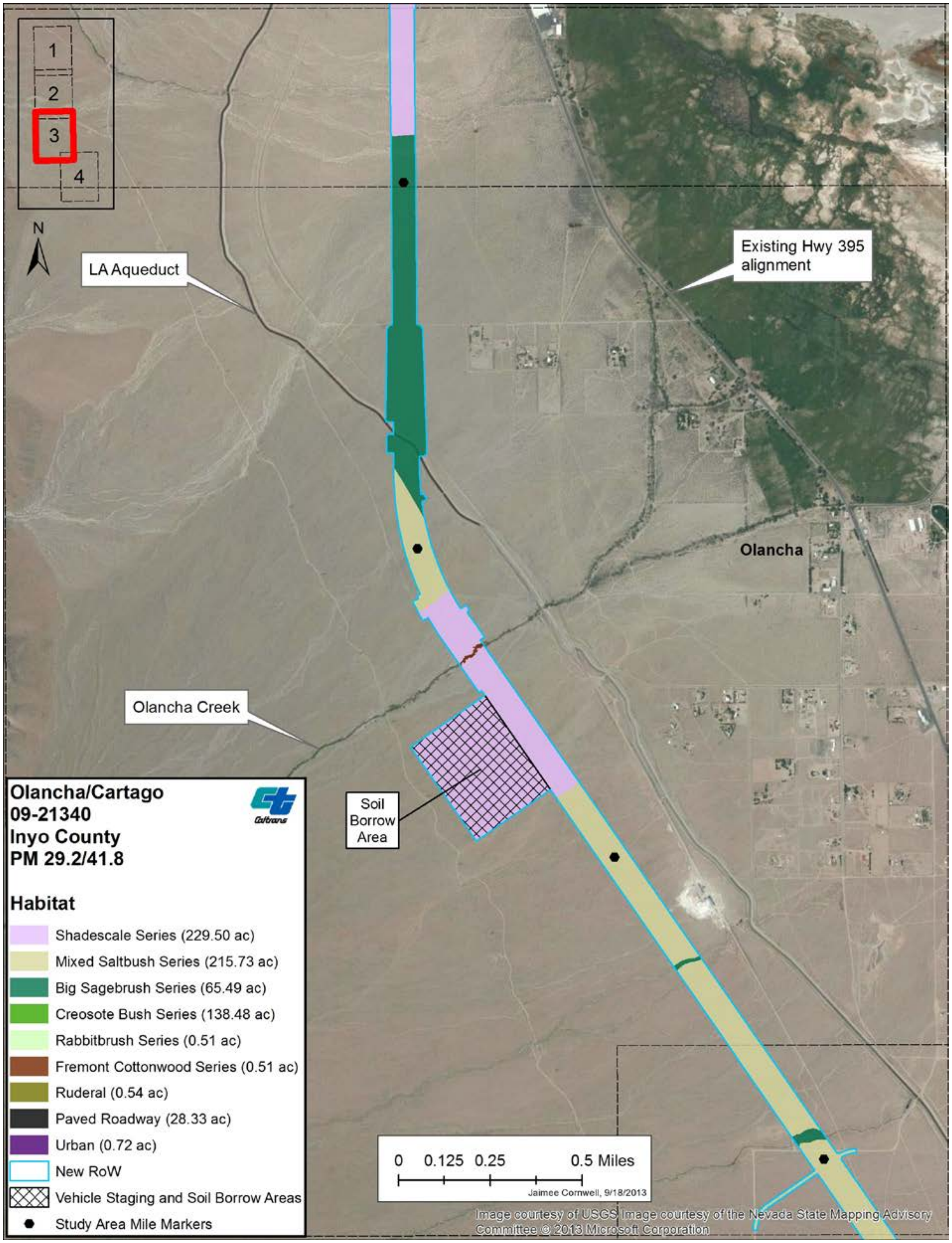
Jaimee Cornwell, 9/18/2013
Image courtesy of USGS Image courtesy of the Nevada State Mapping Advisory Committee © 2013 Microsoft Corporation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Jaimee Cornwell, 9/18/2013
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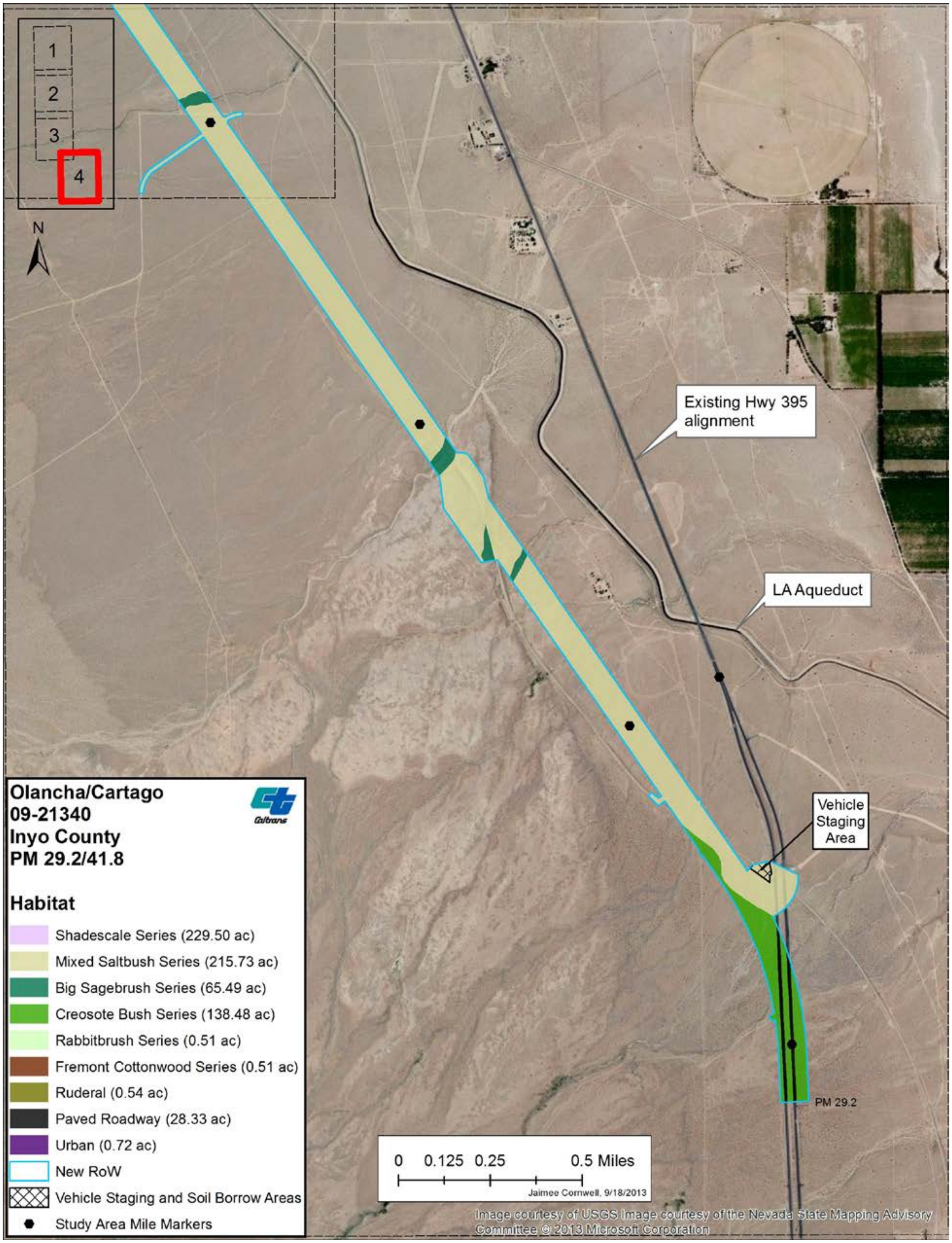
1
2
3
4
N
Existing Hwy 395 alignment
LA Aqueduct
Vehicle Staging Area
PM 29.2
Olancha/Cartago
09-21340
Inyo County
PM 29.2/41.8
Habitat
Shadescale Series (229.50 ac)
Mixed Saltbush Series (215.73 ac)
Big Sagebrush Series (65.49 ac)
Creosote Bush Series (138.48 ac)
Rabbitbrush Series (0.51 ac)
Fremont Cottonwood Series (0.51 ac)
Ruderal (0.54 ac)
Paved Roadway (28.33 ac)
Urban (0.72 ac)
New RoW
Vehicle Staging and Soil Borrow Areas
Study Area Mile Markers
0 0.125 0.25 0.5 Miles
Jaimee Cornwell, 9/18/2013
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Big Sagebrush Series

The Big Sagebrush Series is generally described as a typically large, open, discontinuous stand of big sagebrush (*Artemisia tridentata*) of fairly uniform height. Big sagebrush commonly has a single central stem which branches into a nearly globular crown. Plants range in height from 1.6 to 9.8 feet and density ranges from very open, widely spaced, small plants to large, closely spaced plants with canopies touching. In addition to having a deep root system, big sagebrush has a well-developed system of lateral roots close to the soil surface. Consequently, the plants almost completely use the edaphic potential of a site, excluding most other plants in an area up to three times their crown area. This produces stands with shrubs of very uniform size and spacing. Big sagebrush is often mixed with other species of shrubs of similar form and growth habit. In favorable conditions, sagebrush stands have an understory of perennial grasses and forbs.

Sawyer and Keeler-Wolf describe this series as occurring on well-drained, gravelly soils in a variety of sites including valleys, dry washes, and alluvial fans. In the BSA, this habitat community was observed along the banks of several unnamed ephemeral drainages that transect the project site. Areas occupied by the Big Sagebrush Series cover approximately 65.49 acres and remain fairly undisturbed. This series was described during the previous botanical surveys as being dominated by native shrubs with a smaller presence of both native and exotic annuals in the understory.

Creosote Bush Series

The Creosote Bush Series is generally described as an open scattered assemblage of creosote bush (*Larrea tridentata*) as well as other microphyll shrubs ranging between 1.5 and 6.5 feet in height. Canopy cover is generally less than 50 percent and there is often bare ground between shrubs (Kuchler 1977, Cheatham and Haller 1975). However, spring and summer annuals may occur as a ground cover in this community (Sawyer and Keeler-Wolf 1995).

The Creosote Bush Series is found on well-drained soils of flats, slopes, alluvial fans, and valleys (Vasek and Barbour 1977, Holland 1986, Sawyer and Keeler-Wolf 1995). In the BSA this series is found in both the northern and southern portions of the project site, where it has been noted to intergrade with the Shadscale and Mixed Saltbush Series'. The Creosote Bush Series covers approximately 138.48 acres of the BSA and the majority of areas occupied by this series is in close proximity to the existing alignment and is therefore considered to be more disturbed.

Fremont Cottonwood Series

The Fremont Cottonwood Series is typically dominated by Fremont Cottonwood (*Populus fremontii*), a facultative wetland species that grows approximately 80 feet tall. This series is typical of riparian areas where soils are flooded intermittently by fresh water, but remain saturated continuously (Sawyer and Keeler-Wolf 1995). In the BSA, the Fremont Cottonwood Series occupies approximately 0.51 acres of habitat and only occurs along Olancha Creek. The habitat in this series was recently assessed and can be described as having a moderate to higher value of quality, as it remains generally undisturbed and contains a somewhat diverse array of forbs within the understory.

Mixed Saltbush Series

The Mixed Saltbush Series is a shrub-dominated community with a sparse ground cover in which no particular saltbush (*Atriplex* sp.) species dominates the community (Sawyer and Keeler-Wolf 1995). This community is better thought of as a collection of species-defined series, such as the Shadscale Scrub Series, Allscale Series, Four-wing Saltbush Series, etc. Similar to these other mentioned series', the Mixed Saltbush Series is also found on well-drained soils of flats, slopes, alluvial fans, and valleys (Sawyer and Keeler-Wolf 1995). However, these soils may be carbonate rich, resulting in the high diversity that is unique to this series. This Series covers approximately 215.73 acres and is the second most prominent habitat type within the project area. The Mixed Saltbush Series occurs near Olancha Creek and continues southward, dominating the southern portion of the project site. Mixed Saltbush closely intergrades with the Shadscale Series and the quality of this habitat is assumed to be moderately high due to its’ high diversity and occupancy in areas that are relatively undisturbed and west of the existing alignment.

Rubber Rabbitbrush Series

The Rubber Rabbitbrush Series is dominated by various subspecies of rubber rabbitbrush (*Ericameria nauseosus*). Some of these subspecies are general endemics to local areas; others have extensive ranges including disturbed areas occupying abandoned agricultural lands and over-grazed pastures. The species within this series can grow in association with other series dominated by trees, shrubs and even grasses (Sawyer and Keeler-Wolf 1995).

The Rubber Rabbitbrush Series typically occurs on well-drained, gravelly soils within alluvial fans and valleys (Sawyer and Keeler-Wolf 1995). This series can also be indicative of disturbance (Holland 1986). Only 0.51 acres of habitat within the project site are occupied by this series and are located in close proximity to the existing alignment which is consistent with its' potential indication of previous disturbance.

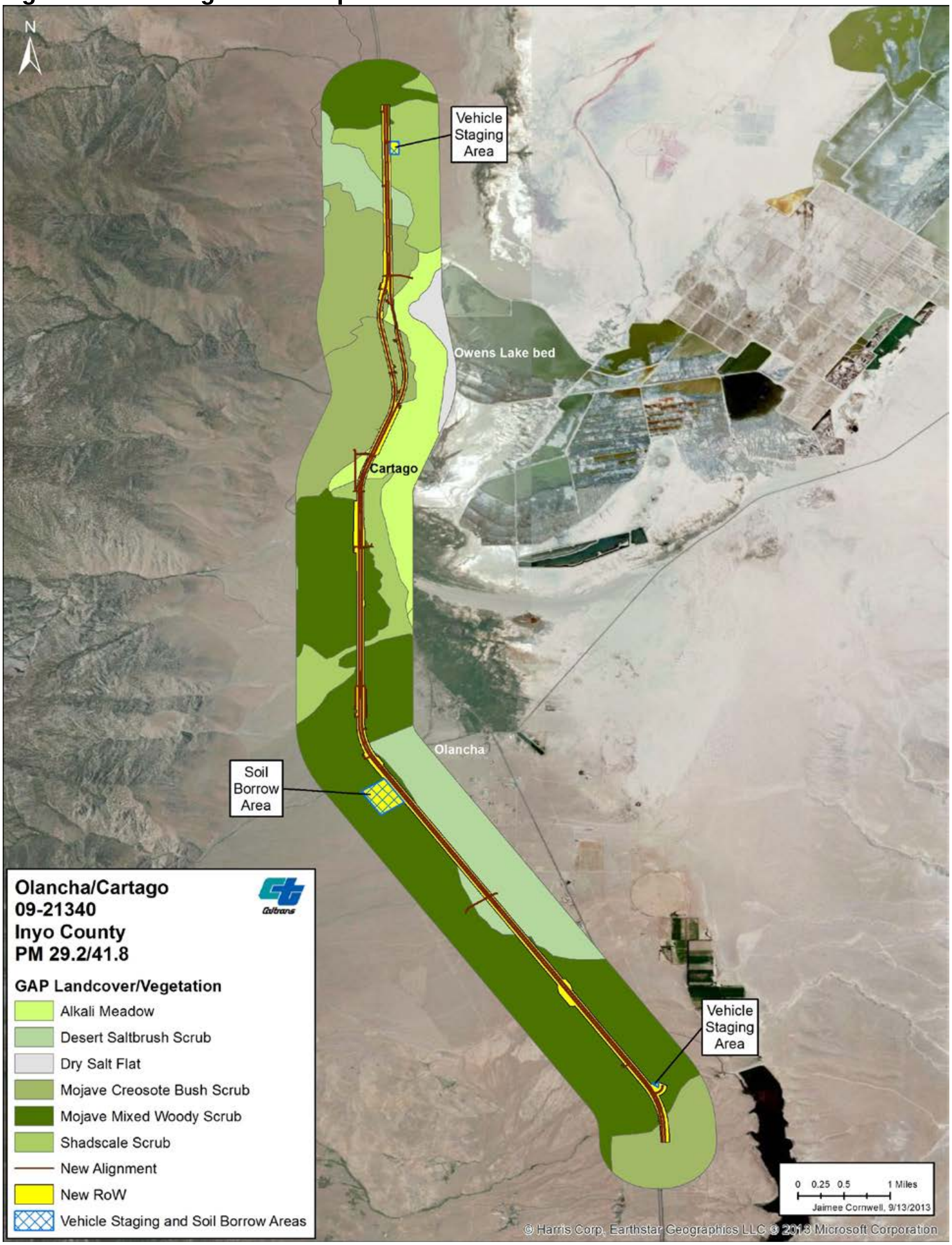
Shadscale Series

The Shadscale Series is an upland vegetation site dominated by shrubs that contains a relatively sparse ground cover, except during the spring months when annual species are blooming (Sawyer and Keeler-Wolf 1995). This series can occur on poorly-drained flats with saline or alkaline soils, or on well-drained slopes (Vasek and Barbour 1977, Holland 1986). Although this series commonly intergrades with other series that also occur in similar soils, the Shadscale Series typically occurs on soils with drier conditions (Vasek and Barbour 1977).

This series was found to intergrade closely with the Mixed Saltbush Series, making it difficult to differentiate between the two habitats. In these instances, the biologists who performed the botanical surveys only mapped the Shadscale Series where shadscale was clearly dominant. Areas where shadscale was present, but not dominant, were mapped as Mixed Saltbush Series. It should be noted that small patches of the Mixed Saltbush Series are likely present within larger areas mapped as the Shadscale Series, and vice versa, due to the high degree of intergrade between the two series. This Series covers approximately 229.50 acres and is the dominant habitat community on the project site. Areas occupied by this type of habitat likely range from moderate to moderately high in quality, as some areas are located adjacent to the existing alignment and other areas are located almost a mile west of the current alignment.

Other areas within the proposed project site were mapped as "ruderal" and "urban" during the 2001/2002 and 2008 botanical surveys. Although these areas occupy portions of the proposed alignment (ruderal- 0.54 acres and urban- 0.72 acres) they have not been included or described here as habitat types; however, they are assumed to be of low quality. Please refer to Figure 8 for the mapped vegetation types within the project site according to the California GAP analysis (University of California, Santa Barbara 2002).

Figure 8: GAP Vegetation Map



3.1.3. Common Wildlife

The BSA provides suitable habitat for a variety of species from several different biogeographic regions, including the Great Basin, Mojave Desert, White-Inyo mountains, and Sierra Nevada mountains, as well as species unique to the groundwater-dependent alkali meadows on the valley floor.

The Tule Elk *(Cervus elaphus nannodes*) are the smallest form of elk, and once roamed the Central Valley and Coast Range of California, their native habitat, until being hunted nearly to extinction by 1870. Although this species is not native to the Eastern Sierra, the Owens Valley's Tule Elk herd originated as a group of 27 elk released into the area around the Tinemaha Reservoir in the 1930s. They had first been relocated to the Yosemite Valley, but were later evicted by the Park Service, as they are not native to Yosemite either. The Tule elk herd lives far enough north of the proposed project that they are not being considered a species of concern for this project. Therefore, the Tule elk will not be further addressed in this document.

Mule deer (*Odocoileus hemionus*) overwinter on the alluvial fans at the base of the Sierra Nevada in the west and frequently migrate through the Owens River valley to and from their winter range in the volcanic tablelands at the north end of the valley. Mountain lions (*Felis concolor*), occupy the same range. On the east side of the valley, Sierra Nevada bighorn sheep (*Ovis canadensis sierrae)* range from the ridges of the White and Inyo Mountains down to relatively low elevations in stream canyons on the west side of the escarpment.

Several species of bats occupy the Owens Valley, including brown bats (both *Eptesicus fuscus* and *California myotis*) and western pipistrelles (*Pipistrellus hesperus*).

Side-blotched lizard (*Uta stansburiana*), white-tailed antelope ground squirrel, Merriam’s kangaroo rat (*Dipodomys merriami*), turkey vulture (*Cathartes aura*), and common raven (*Corvus corax*) can all also be found commonly within the project area. For a complete list of all wildlife observed within project site during surveys for the various proposed alignments, refer to Appendix C.

3.1.3.1. Description of Migration Corridors

The generally north-south orientation of the Owens Valley facilitates the seasonal migration of birds, and likely that of bats.

Historically, the Owens Lake was one of the most important stopover sites for migrating waterfowl and shorebirds in the western United States for thousands of years. The National Audubon Society designated Owens Lake as a nationally significant Important Bird Area (IBA) due to the multitude of shorebirds that stop at the lake during their fall and spring migrations between the Arctic and Central and South Americas. Another contributing factor to the IBA designation is the large number of snowy plovers that nest on Owens Lake; furthermore, several thousand snow geese and ducks over-winter at the lake.

In spring, thousands of migrating shorebirds move north from wintering areas as far south as Argentina (Patagonia) and Tierra del Fuego. These masses of birds migrate through North America to breed in the boreal forests of Alaska and Canada as well as the high Arctic along the Bering Sea and Arctic Ocean. Along their routes, migrants stop at rich feeding sites such as coastal wetlands and estuaries as well as inland lakes in the Great Basin such as Mono Lake, Great Salt Lake, and Owens Lake.

The only known non-flying mammal migrant in the vicinity of the project site is the mule deer, mentioned above, which migrate from their high-elevation summer range in the Sierra Nevada to lower elevations that are more sustainable in winter. Mule deer are specifically known to over-winter on the alluvial fans along the eastern slope of the Sierra as well as to migrate north through the Owens River valley to another winter-range on the volcanic tablelands at the north end of the Valley.

3.1.4. Invasive species

The BSA was evaluated for the presence of invasive species based on the *USDA Federal Weed List* and the *California Department of Food and Agriculture (CDFA) Federal Weed List* (USDA 2010 and CDFA 2013, respectively). Russian thistle (*Salsola tragus*) is the only species of plant within the project that is listed as a noxious weed (CDFA 2013).

Other invasive species observed in the project site that are not included on the federal or state noxious weed lists, but are included on the *California Invasive Plant Inventory*, which rates each species as “High”, “Moderate”, or “Limited” are as follows: Giant reed (*Arundo donax*- High), wild oats (*Avena fatua*- Moderate), five-horn bassia (*Bassia hyssopifolia*- Limited), ripgut brome (*Bromus diandrus*- Moderate), red brome (*Bromus madritensis* ssp. *rubens*- High), cheatgrass (*Bromus tectorum*- High), Italian ryegrass (*Lolium multiflorum*- Moderate), black locust (*Robina pseudoacacia*- Limited), Mediterranean grass (*Schismus arabicus*- Limited) and salt cedar (*Tamarix ramosissima*- High) (California Invasive Plant Council 2013). The *California Invasive Plant Inventory* ratings provided for each of these species have been defined as: High- this species has severe ecological impacts; Moderate- this species has substantial and apparent ecological impacts; Limited- this species has minor ecological impacts.

Giant reed, wild oats, Italian ryegrass, and Russian thistle occurred only on the roadside along the existing lanes of Highway 395 and were quite sparse. Cheat grass and Mediterranean grass also were sparse and were observed only along dirt roads. Red brome was found occasionally in a variety of plant communities but did not grow in dense stands based on observations made during the survey years. Black locust was found at an old home site and is planted along Highway 395 in Olancha. Fivehook bassia was confined to an alkaline area north of Cartago near Willow Dip. Salt cedar forms a large stand east of Highway 395 south of Olancha and could spread to other riparian areas if left unchecked.

3.2. Regional Species and Habitats of Concern

3.2.1. Fremont Cottonwood Series

Within the BSA, the Fremont Cottonwood Series occupies approximately 0.51-acre of land, which is located along Olancha Creek. The Fremont Cottonwood Series as described by Sawyer and Keeler is also referred to as Mohave Riparian Association (CNDDB 2002b) and Mohave Riparian Forest (Holland 1986). This series is typically dominated by Fremont cottonwood, a facultative wetland species that grows to approximately 80 feet. This series is typical of riparian areas, where soils are flooded intermittently by fresh water but remain saturated continuously (Sawyer and Keeler-Wolf 1995). The soils vary from silty alluvial to rocky, sandy, well-drained substrates (Bradley and Deacon 1967; Cheatham and Haller 1975). The soils in this series are generally moist, but can be dry at the surface with moisture beginning at a depth of several meters below the ground surface (Cheatham and Haller 1975).

3.2.2. Regional Species and Natural Communities of Special Concern

Table 5 below provides a list of all federal- and state-listed species, sensitive species without an official listing status and natural communities of special concern and that have the potential to occur within the BSA. This table additionally includes habitat descriptions, a determination of the presence or absence of suitable habitat within the BSA and rationale for the determinations.

Table 5: Regional Species of Concern

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Natural Communities of Special Concern:					
Active desert dunes (Olancha Dunes)		NCSC	Desert dunes composed of quartz sand.	A	There are no desert dunes located within the project site.
Alkali Seep		NCSC	Wetland/meadow/seep habitat with sandy loam soils and the following potential species: Calochortus excavatus, Distichlis spicata, Poa sp., Elymus cinereus, Rosa sp., Salix sp., Ericameria nauseosus, Artemisia tridentata, Sarcobatus vermiculatus, Juncus balticus, Sporobolus airoides and Bromus tectorum.	A	There are no alkali seeps within the project site.
Fremont Cottonwood Series		-	Riparian habitat dominated by Fremont cottonwood; soils are typically saturated or frequently flooded.	P	This series has been observed within the project site along Olancha Creek.
Plants:					
Abronia alpina	Ramshaw Meadows abronia	FC/CNPS 1B.1	Found in dry, open, granitic meadows and seeps. Blooming period: July-August; elevation: 7,870-9,000 feet.	A	Not within elevation range.

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Astragalus atratus var. mensanus	Darwin Mesa milk-vetch	CNPS 1B.1/BLMS	Found in volcanic, gravelly clay. Blooming period: April-June; elevation 4,396-7,595 feet.	A	Not within elevation range.
Astragalus hornii var. hornii	Horn's milk-vetch	CNPS 1B.1/BLMS	Found in alkaline seeps and meadows. Blooming period: May-October; elevation 197-2,789 feet.	A	Not within elevation range.
Astragalus lentigenosus var. kernensis	Kern Plateau milk-vetch	CNPS 1B.2	Found in meadows and seeps, in subalpine coniferous forest with sandy soils. Blooming period: June-July; elevation: 7,700-9,090 feet.	A	Not within elevation range.
Boechera tularensis	Tulare rockcress	CNPS 1B.3	Found on rocky slopes in subalpine coniferous forests. Blooming period: June-July; elevation 5,988-10,991 feet.	A	Not within elevation range.
Botrychium ascendens	upswept moonwort	CNPS 2B.3	Found in meadows, seeps, and lower coniferous forests. Blooming period: July-August; elevation 4,921-10,499 feet.	A	Not within elevation range.
Botrychium crenulatum	scalloped moonwort	CNPS 2B.2	Found in bogs, fens, upper and lower coniferous forests, meadows, seeps, marshes, and swamps. Blooming period: June-September; elevation 4,160-11,811 feet.	A	Not within elevation range.

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Botrychium lunaria	common moonwort	CNPS 2B.3	Found in meadows, seeps, and coniferous forests. Blooming period: August; elevation: 6,496-11,155 feet.	A	Not within elevation range.
Botrychium minganense	mingan moowort	CNPS 2B.2	Found in bogs, fens, and upper and lower coniferous forests. Blooming period: July-September; elevation: 4,773-10,171 feet.	A	Not within elevation range.
Calochortus excavatus	Inyo County star-tulip	CNPS 1B.1/BLMS	Found in alkaline meadows and seeps. Blooming period: April-August; elevation: 3,773-6,562 feet.	A	Although there are no alkaline meadows or seeps within the project site, this species was surveyed for during both of the formal botanical surveys and one of the focused surveys and was not observed.
Calyptridium pygmaeum	pygmy pussypaws	CNPS 1B.2	Found in sandy, gravelly coniferous forests. Blooming period: June-September; elevation: 6,497-10,499 feet.	A	Not within elevation range.
Castilleja campestris var. succulenta	succulent owl's-clover	FT/SE/CNPS 1B.2	Found in vernal pools and moist places within valley and foothills grasslands. Blooming period: April-May; elevation: 165-2,460 feet.	A	Not within elevation range.
Cordylanthus eremicus ssp. kernensis	Kern Plateau bird's beak	CNPS 1B.3	Found in Great Basin scrub, Joshua tree woodland, pinyon and juniper woodland, and coniferous forests. Blooming period: May-September; elevation: 5,495-9,843 feet.	A	Not within elevation range.

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Cryptantha circumscissa var. rosulata	rosette cushion cryptantha	CNPS 1B.2	Found in gravelly, rocky fields and coniferous forests. Blooming period: July-August; elevation: 9,679-12,008 feet.	A	Not within elevation range.
Cymopterus ripleyi var. saniculoides	sanicle cymopterus	CNPS 1B.2/BLMS	Found in gravelly, sandy Joshua tree woodlands and Mojavean desert scrubs. Blooming period: April-June; elevation: 3,281-5,446 feet.	HP	Potential habitat is present within the BSA; however, this species was not observed during any of the floristic surveys.
Deinandra mohavensis	Mojave tarplant	SE/CNPS 1B.3/BLMS	Found in moist sites in chaparral, coastal scrub, and riparian scrub. Blooming period: May-January; elevation: 1,509-5,249 feet.	HP	Potential habitat is present within the BSA; however, this species was not observed during any of the floristic surveys.
Eremothera boothii ssp. boothii	Booth’s evening primrose	CNPS 2B.3	Found in Joshua tree woodlands and pinyon-juniper woodlands. Blooming period: March-September; elevation: 2,671-7,874 feet.	A	There are no Joshua tree “woodland” or pinyon-juniper woodland within the project site.
Eriogonum mensicola	Pinyon Mesa buckwheat	CNPS 1B.3/BLMS	Found in rocky, gravelly Great Basin scrub, pinyon and juniper woodlands, and coniferous forests. Blooming periods: July-September; elevation: 5,906-8,858 feet.	A	Not within elevation range.
Eriogonum wrightii var. olanchense	Olancha Peak buckwheat	CNPS 1B.3	Found in boulder, rocky fields, and coniferous forests. Blooming period: July-September; elevation: 10,696-11,598 feet.	A	Not within elevation range.

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Erythranthe calcicola	limestone monkeyflower	CNPS 1B.3/BLMS	Mojave desert scrub, Joshua tree woodland, pinyon and juniper woodland, primarily on talus slopes on substrates derived from calciferous rock. Blooming period: April-June; elevation: 3,000-7,105	HP	Potential habitat is present within the BSA; however, this species was not observed during any of the floristic surveys.
Hackelia sharsmithii	Sharsmith's stickseed	CNPS 2B.3	Found in granitic, rocky boulder fields, and coniferous forests. Blooming period: July-September; elevation: 9,843-12,139 feet.	A	Not within elevation range.
Ivesia campestris	field ivesia	CNPS 1B.2	Found in meadows, seeps, and coniferous forests. Blooming period: May-September; elevation: 6,480-11,139 feet.	A	Not within elevation range.
Lupinus padre-crowleyi	Father Crowley's lupine	CNPS 1B.2	Found in Great Basin scrub, riparian forests and scrub, and coniferous forests. Blooming period: July-September; elevation: 7,218-13,123 feet.	A	Not within elevation range.
Mentzelia tridentata	creamy blazing star	CNPS 1B.3/BLMS	Found in rocky, gravelly, sandy Mojavean desert scrub. Blooming period: February-June; elevation: 2,297-4,265 feet.	HP	Potential habitat is present within the BSA; however, this species was not observed during any of the floristic surveys.
Minuartia stricta	bog sandwort	CNPS 2B.3	Found in boulder and rocky fields, alpine dwarf scrub, meadows and seeps. Blooming period: July-September; elevation: 8,005-12,992 feet.	A	Not within elevation range.

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Monardella beneolens	sweet-smelling monardella	CNPS 1B.3/BLMS	Found in granitic, boulder, rocky fields, and coniferous forests. Blooming period: June-September; elevation: 8,202-11,811 feet.	A	Not within elevation range.
Neostapfia colusana	Colusa grass	FT/SE/CNPS 1B.1	Found in vernal pools. Blooming period: May-August; elevation: 15-660 feet.	A	Not within elevation range; no vernal pools are located on the project site.
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	FT/SE/CNPS 1B.1	Found in vernal pools. Blooming period: April-September; elevation 30-2,625 feet.	A	Not within elevation range; no vernal pools are located on the project site.
Oryctes nevadensis	Nevada oryctes	CNPS 2B.1	Found in sandy, chenopod scrub, and Mojavean desert scrub. Blooming period: April-June; elevation 3609-8317 feet.	HP	Potential habitat is present within the BSA; however, this species was not observed during any of the floristic surveys.
Phacelia inyoensis	Inyo phacelia	CNPS 1B.2/BLMS	Found in alkaline meadows and seeps. Blooming period: April-September; elevation 3002-10,499 feet.	HP	Potential habitat is present within the BSA; however, this species was not observed during any of the floristic surveys.
Phacelia nashiana	Charlotte's phacelia	CNPS 1B.2/BLMS	Found in granitic, sandy habitats, pinyon woodlands, and desert scrub. Blooming period: February-June; elevation 0-7874 feet.	HP	Potential habitat is present within the BSA; however, this species was not observed during any of the floristic surveys.

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Plagiobothrys parishii	Parish's popcornflower	CNPS 1B.1	Found in alkaline Great Basin scrub and Joshua tree woodlands in alkaline, mesic soils. Blooming period: March-November; elevation 2461-7251 feet.	A	Alkaline soils are not present within the project site; however, a population of a rare species of *Plagiobothrys* (either *parishii* or a different undescribed species) was observed approximately 460 feet east of the project site in an alkaline wetland bordering the margin of Owen's Lake.
Poa lettermanii	Letterman's blue grass	CNPS 2B.3	Found in Alpine boulder and rocky fields. Blooming period: July-September; elevation 11,483-13,993 feet.	A	Not within elevation range.
Pohlia tundrae	tundra thread moss	CNPS 2B.3	Found in alpine boulder and rocky fields. Blooming period: n/a; elevation 8858-9843 feet.	A	Not within elevation range.
Sarcobatus baileyi	Bailey's greasewood	CNPS 2B.3	Found in alkaline, dry lakes, washes, and roadsides. Blooming period: April-July; elevation 4921-524 9 feet.	A	Not within elevation range.
Sidalcea covillei	Owens Valley checkerbloom	SE/CNPS 1B.1/BLMS	Found in alkaline chenopod scrub, meadows, and seeps. Blooming period: April-July; elevation 3593-4642 feet.	A	Although alkaline soils are not present within the project site, this species was surveyed for during both of the formal botanical surveys and one of the focused surveys, but was not observed on the project site.

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Sidalcea multifida	cut-leaf checkerbloom	CNPS 2B.3	Found in Great Basin scrub, coniferous forests, meadows, seeps, and pinyon woodlands. Blooming period: May-September; elevation 5741-9186 feet	A	Not within elevation range.
Tuctoria greenei	Greene's tuctoria	FE/SR/CNPS 1B.1	Found in vernal pools. Blooming period: May-September; elevation: 95-3,515 feet.	A	Not within elevation range; no vernal pools are located on the project site.
Trifolium dedeckerae	Dedecker's clover	CNPS 1B.3/BLMS	Found in granitic, rocky, coniferous forests, pinyon and juniper woodlands, and coniferous forests. Blooming period: May-July; elevation 6890-11,483 feet.	A	Not within elevation range.
Triglochin palustris	marsh arrow-grass	CNPS 2B.3	Found in meadows, seeps, marshes, swamps, and coniferous forests. Blooming period: May-September; elevation 6890-12,139 feet.	A	Not within elevation range.
Viola pinetorum var. grisea	grey-leaved violet	CNPS 1B.3	Found in meadows, seeps, and coniferous forests. Blooming period: April-August; elevation: 4,921-12,139 feet.	A	Not within elevation range.
Fish:					
Cyprinodon radiosus	Owens pupfish	FE/SE	Found in natural, artificial and Great Basin streams, or standing waters; requires good water quality; elevation: 3,560-3,700 feet.	HP	Five populations remain, but none are within the vicinity of the project site.[1]

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Oncorhynchus mykiss aguabonita	Volcano Creek golden trout	CSC	Found in wide, shallow and exposed streams with little riparian vegetation.	A	There are no documented occurrences of this species in Inyo County.
Siphateles bicolor snyderi	Owens Tui chub	FE/SE	Found in flowing and standing Great Basin waters; prefers clean, clear, shallow water in streams, creeks and medium rivers; elevation: 3,520-3,700 feet.	HP	Six populations remain, but none are within the vicinity of the project site.[1]
Amphibians:					
Anaxyrus canorus or Bufo canorus	Yosemite toad	FC/FPT/CSC	Found in wet meadows, seeps, wetlands and on borders of subalpine coniferous forest in the central high Sierra; elevation: 6,400-11,300 feet.	A	Not within elevation range.
Rana muscosa	mountain yellow-legged frog (southern Sierra Nevada population)	FE/SE/CSC	Found in high Sierra mountain lakes, ponds, marshes and streams south of the Tehachapi range; elevation: 4,590-12,110 feet.	A	This species range is outside the vicinity of the project site; not within elevation range.
Rana sierrae	mountain yellow-legged frog (northern Sierra Nevada population)	FPE/ST/CSC	Found in high Sierra mountain lakes, ponds, marshes and streams north of the Tehachapi range; elevation: 4,000-12,000 feet.	A	Not within elevation range.[2]
Reptiles:					
Gopherus agassizii	desert tortoise	FT/ST	Found in desert scrub, desert wash, and Joshua tree habitats in the Mojave, Sonoran, and Colorado deserts; elevation: 3,455-3,900 feet.	P	Tortoises, burrows and scat have been found in the project site.

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Sceloporus graciosus graciosus	northern sagebrush lizard	BLMS	Found on the ground, near logs, rocks, bushes or bush piles; needs good light, open ground and scattered low bushes. Elevation: ~3,800 feet.	HP	Potential habitat is present within the BSA.
Birds:					
Aquila chrysaetos	golden eagle	SFP/BLMS	Found in rolling foothills, mountain areas, sage-juniper flats, and deserts.	P	Potential habitat is present within the BSA.
Athene cunicularia	Burrowing owl	CSC/BLMS	Found in open, dry annual or perennial grasslands, deserts & scrublands characterized by low-growing vegetation.	P	Potential habitat is present within the BSA.
Buteo swainsoni	Swainson's hawk	ST/BLMS	Found in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, & agricultural or ranch lands with groves or lines of trees.	HP	Potential habitat is present within the BSA.
Charadrius alexandrinus nivosus	western snowy plover	FT/CSC	Found in Great Basin standing waters, sand shores, salt flats and wetlands; elevation: approximately 3,600 feet.	A	No habitat is present; no areas where creeks flow into the margins of Owens Lake in the BSA.
Charadrius montanus	mountain plover	CSC/BLMS	Found in short grasslands, freshly plowed fields, newly sprouting grain fields, and sometimes sod farms.	HP	Potential habitat is present in the BSA.

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Empidonax traillii extimus	southwestern willow flycatcher	FE/SE	Found in dense riparian habitats with saturated soils, standing water, or, nearby streams, pools, or cienegas; elevation: near sea level to approximately 8,500 feet.	HP	Potential habitat within the BSA is located along Olancha Creek where the dominant vegetation consists of *Salix* sp. and *Populus* sp., with an approximate maximum width of 30 feet. The BSA is not within mapped Critical Habitat and the potential on-site habitat is marginal and unlikely to be suitable for nesting, but may be suitable for migratory and/or foraging activities.
Icteria virens	yellow-breasted chat	CSC	Found in riparian thickets of willow and other brushy tangles near watercourses.	HP	Potential habitat is present within the BSA.
Ixobrychus exilis	least bittern	CSC	Found in marshlands and borders of ponds and reservoirs which provide ample cover.	A	There are no marshlands or borders of ponds or reservoirs within the project site.
Lanius ludovicianus	loggerhead shrike	CSC	Found in broken woodlands, savannah, pinyon-juniper, Joshua tree, & riparian woodlands, desert oases, scrub and washes.	P	Potential habitat is present within the BSA.
Toxostoma lecontei	Le Conte's thrasher	CSC	Found in desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats.	P	Potential habitat is present within the BSA.
Vireo bellii pusillus	least Bell's vireo	FE/SE	Found along watercourses in structurally diverse riparian forest, scrub or woodlands including cottonwood-willow forests, oak woodlands, and mule fat scrub; elevation: below sea level to	HP	Although marginal habitat is present along Olancha Creek, this species has not been documented within the vicinity of the project site since 1891[3]. Therefore, this species is not

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
			approximately 4,000 feet.		expected to occur within the BSA.
Mammals:					
Antrozous pallidus	pallid bat	CSC/R/BLMS	Found in chaparral, coastal scrub, desert wash, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, riparian woodland, Sonoran desert scrub, upper montane coniferous forest, valley and foothill grassland; roosts must protect bats from high temperatures; very sensitive to disturbance of roosting sites; most common in open, dry habitats with rocky areas for roosting; elevation: up to 9,840 feet.	P	Although there are no rocky areas suitable for roosting within the BSA, this species was detected on the project site during the 2001 bat surveys and likely uses the site for feeding.
Corynorhinus townsendii	Townsend's big-eared bat	SCT/BLMS	Found in broad-leaved upland forest, chaparral, chenopod scrub, Great Basin grasslands and Great Basin scrub; most common in mesic sites; roosts in the open, hanging from walls and ceilings of old mines, caves and other roosting areas.	HP	Although there are no old mines or caves on the project site, this species is believed to also be present in areas where pallid bats are found.
Euderma maculatum	spotted bat	CSC/R/BLMS	Found in a wide variety of habitats from arid deserts and grasslands through mixed conifer forests; roosts in rock crevices in cliffs or caves.	P	Although there are no rocky areas suitable for roosting within the BSA, this species was detected on the project site during the 2001 bat surveys and likely uses the site for feeding.

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Gulo gulo	California wolverine	FPT/ST/SFP	Inhabits a wide variety of high elevation habitats such as: alpine, alpine dwarf scrub, wetlands, meadows and seeps, montane dwarf scrub, north coast coniferous forest, riparian forest, subalpine coniferous forest and upper montane coniferous forest. Specifically uses caves, logs and burrows for cover and denning; elevation: 7,880-11,600 feet.	A	Not within elevation range
Lasionycteris noctivagans	silver-haired bat	R	Found in lower montane coniferous forests, old-growth, and riparian forests; roosts in hollow trees, beneath exfoliating bark, abandoned woodpecker holes & rarely under rocks. Needs drinking water.	HP	Potential roosting habitat is present within the BSA.
Martes pennanti	Pacific fisher - DPS[4]	FC/SCT/CSC/BLMS	Occupies north coast coniferous forest, old growth and riparian forest; elevation: 240-11,100 feet.	A	Although riparian habitat is present along Olancha Creek, this species has been ruled out based on a lack of old growth or dense coniferous forest in the vicinity of the project site and/or Olancha Creek.
Microtus californicus vallicola	Owens Valley vole	CSC/BLMS	Found in wetlands and lush grassy ground in the Owens Valley.	P	Potential habitat is present within the BSA.
Myotis volans	long-legged myotis	R	Found in woodland & forest habitats above 4000 feet; trees are important day roosts; caves and mines are night roosts; nursery colonies are under bark or in hollow trees, crevices or buildings.	P	Habitat is present within the BSA and this species was detected during the 2001 surveys.

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Myotis yumanensis	Yuma myotis	R/BLMS	Found in open forests and woodlands with sources of water over which to feed; distribution is closely tied to water; maternity colonies in caves, mines, buildings or crevices.	P	Habitat is present within the BSA and this species was detected during the 2001 surveys.
Ochotona princeps schisticeps	gray-headed pika	SCT	Found in mountainous areas, generally at higher elevations, often above the treeline up to the limit of vegetation. At lower elevations found in rocky areas within forests or near lakes.	A	There are no mountainous or rocky areas within forests or near lakes within the project site.
Ovis canadensis sierrae	Sierra Nevada bighorn sheep	FE/SE/SFP	Found in alpine, alpine dwarf scrub, chaparral, chenopod scrub, Great Basin scrub, Mojavean desert scrub, montane dwarf scrub, pinyon and juniper woodlands, riparian woodland and Sonoran desert scrub areas where the land is rocky and sparsely vegetated; steep slopes and canyons of the Sierra Nevada; elevation: 4,790-14,100 feet.	A	Not within elevation range[5]
Taxidea taxus	American badger	CSC	Found in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	HP	Potential habitat is present within the BSA.
Vulpes vulpes necator	Sierra Nevada red fox	ST	Found from the Cascades down to the Sierra Nevada. Found in a variety of habitats such as high elevation open conifer woodlands, mountain meadows near treeline and alpine fell fields.	A	There are no open conifer woodlands, high mountain meadows near treeline or alpine fell fields within the BSA.

Scientific Name	Common Name	Status	General Habitat Description	Habitat HP/A	Rationale
Xerospermophilus mohavensis	Mohave ground squirrel	ST/BLMS	Found in open desert scrub, alkali scrub & Joshua tree woodland. Also feeds in annual grasslands. Restricted to Mojave Desert.	P	This species has been observed occupying the southern portion of the BSA.

Absent [A] - No habitat present and no further work needed.
Habitat Present [HP] - Habitat is, or may be present. The species may be present.
Present [P] - Species is present
Critical Habitat [CH] - Project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is present.

Status according to the United States Fish and Wildlife Service:
(FE) Federal Endangered
(FT) Federal Threatened
(FPE) Federal Proposed Endangered
(FPT) Federal Proposed Threatened
(FC) Federal Candidate
(FD) Federal Delisted
(FPD) Federal Proposed for Delisting
(FSC) Federal Species of Concern

Status according to the California Department of Fish and Wildlife:
(SE) State Endangered
(ST) State Threatened
(SFP) State Fully Protected
(SR) State Rare
(SC) State Candidate
(NCSC) Natural Community of Special Concern
(CSC) California Species of Special Concern
(R) CNDDB Rare or Sensitive with no official status, or listed by non-regulatory agency

Status according to the California Native Plant Society, Inventory of Rare and Endangered Plants:
Plant Rank:
(1A) Presumed extinct in California
(1B) Rare, threatened, or endangered in California and elsewhere
(2) Rare, threatened, or endangered in California but common elsewhere
(3) More information is needed
Threat Rank:
.1 - Seriously endangered in California
.2 – Fairly endangered in California
.3 – Not very endangered in California

Status according to the Bureau of Land Management:
(BLMS) Sensitive plant or animal

Note: elevation ranges are approximate and include the lowest and highest extents listed (for plants this includes elevation ranges listed in the *Jepson Manual* and by the CNPS).

[1] - Based on phone and email correspondence with Steve Parmenter (CDFW 2013).

[2] - Based on email correspondence with James Erdman (CDFW 2013).

[3] - Based on CNDDB occurrence data (CDFW 2012), a phone conversation with John Heindel (Eastern Sierra Audubon Society 2013) and email correspondence with Debbie House (LADWP 2013).

[4] - Distinct population segment.

[5] - Based on email correspondence with Thomas R. Stephenson (CDFW 2013).

Chapter 4. Results: Biological Resources, Discussion of Impacts and Mitigation

4.1. Natural Communities of Special Concern

4.1.1. Fremont Cottonwood Series

The Fremont Cottonwood Series within the project site is dominated by Fremont cottonwood (*Populus fremontii)* in the overstory, with Goodding's black willow (*Salix gooddingii*) in the mid-story, as well as some other species of shrubs and forbs in the mid- and low-understories. This series predominates along Olancha Creek and occupies approximately 0.51-acres of land within the BSA. The Fremont Cottonwood Series has been shown to provide valuable overstory canopy cover in desert riparian habitats. This series is important for a variety of wildlife, who use it for perching, nesting, foraging and cover. In California, it has been shown that the Fremont Cottonwood Series supports 2 to 5 times more breeding bird species than other vegetative communities with less overstory (Taylor 2000).

4.1.1.1. AVOIDANCE AND MINIMIZATION MEASURES

Impacts to the habitat along Olancha Creek have been minimized as much as possible, while still allowing for a highway crossing.

4.1.1.2. PROJECT IMPACTS

Approximately 0.51 acres of Fremont Cottonwood habitat will be impacted as a result of the constructed project.

4.1.1.3. COMPENSATORY MITIGATION

Any Fremont cottonwood and native willow trees with a 4-inch, or greater, diameter at breast height (DBH) that are removed for construction will be replanted at a 2:1 ratio as close as possible to the project site. In addition, once construction has been completed a portion of the mitigation required, for impacts to willow and Fremont cottonwood trees along Olancha Creek, will be accomplished on-site along the outside edge of the new Caltrans RoW.

4.1.2. Discussion of Wetlands and WOUS

All areas within the BSA that were suspected of having wetland criteria were delineated in accordance with the USACE 1987 Wetlands Delineation Manual (Environmental Laboratory 1987), the Regional Supplement to the Corps of

Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008) and the Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar and McColley 2008). The field surveys were conducted from April 28 to May 6, 2009. The wetland boundaries were determined using the three-parameter approach outline by the USACE, which examines hydrology, soils and vegetation. The boundaries of WOUS were determined following the methods outlines by Lichvar and McColley (2008).

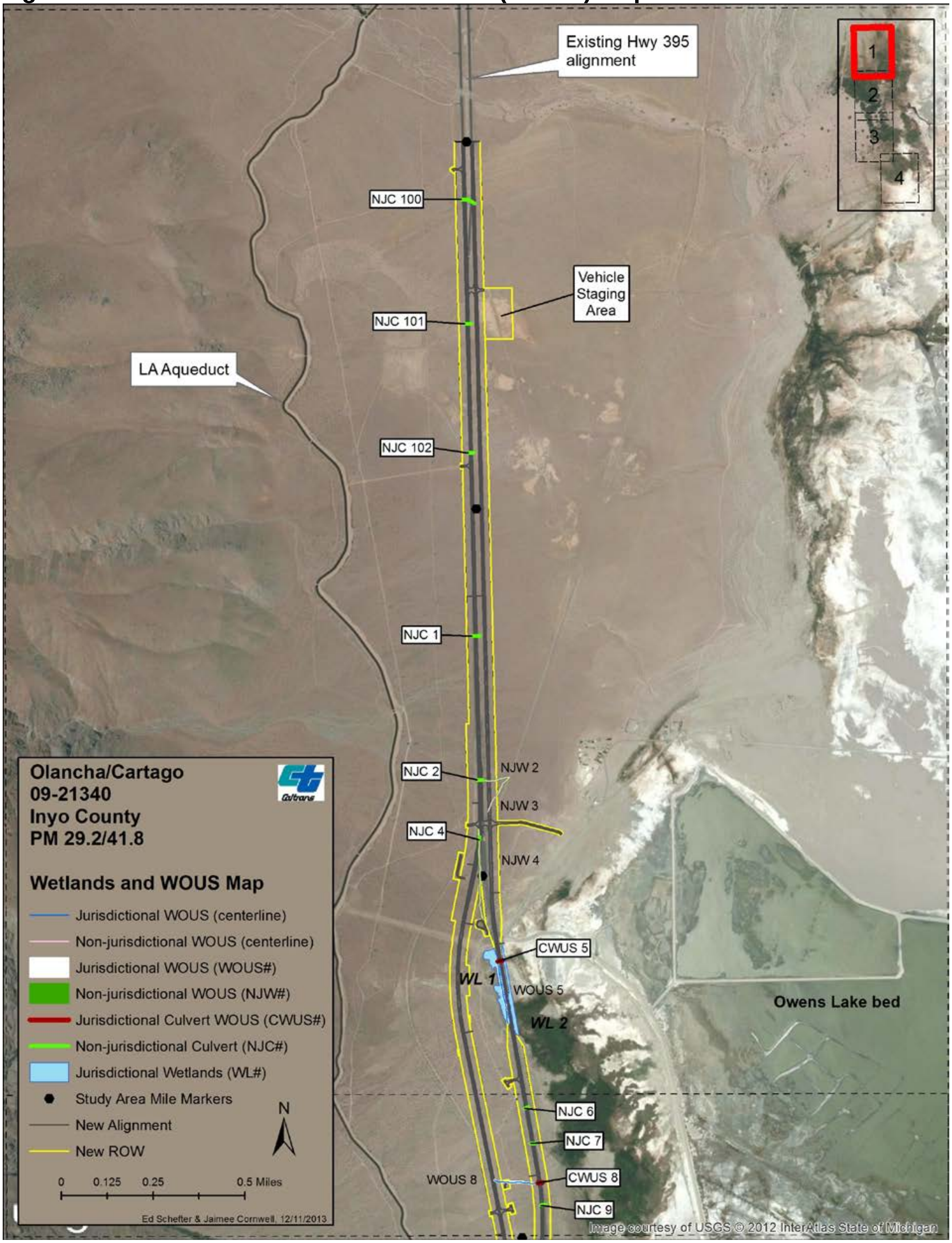
A *Jurisdictional Delineation Report for the Olancha/Cartago 4-Lane Project* was prepared and submitted to the USACE on December 3, 2009 to obtain USACE-verification of the potentially jurisdictional wetlands and WOUS within the project site. On May 18, 2010 the USACE issued a Jurisdictional Determination (JD) for the wetlands and WOUS within the project site; the JD will be valid until May 18, 2015.

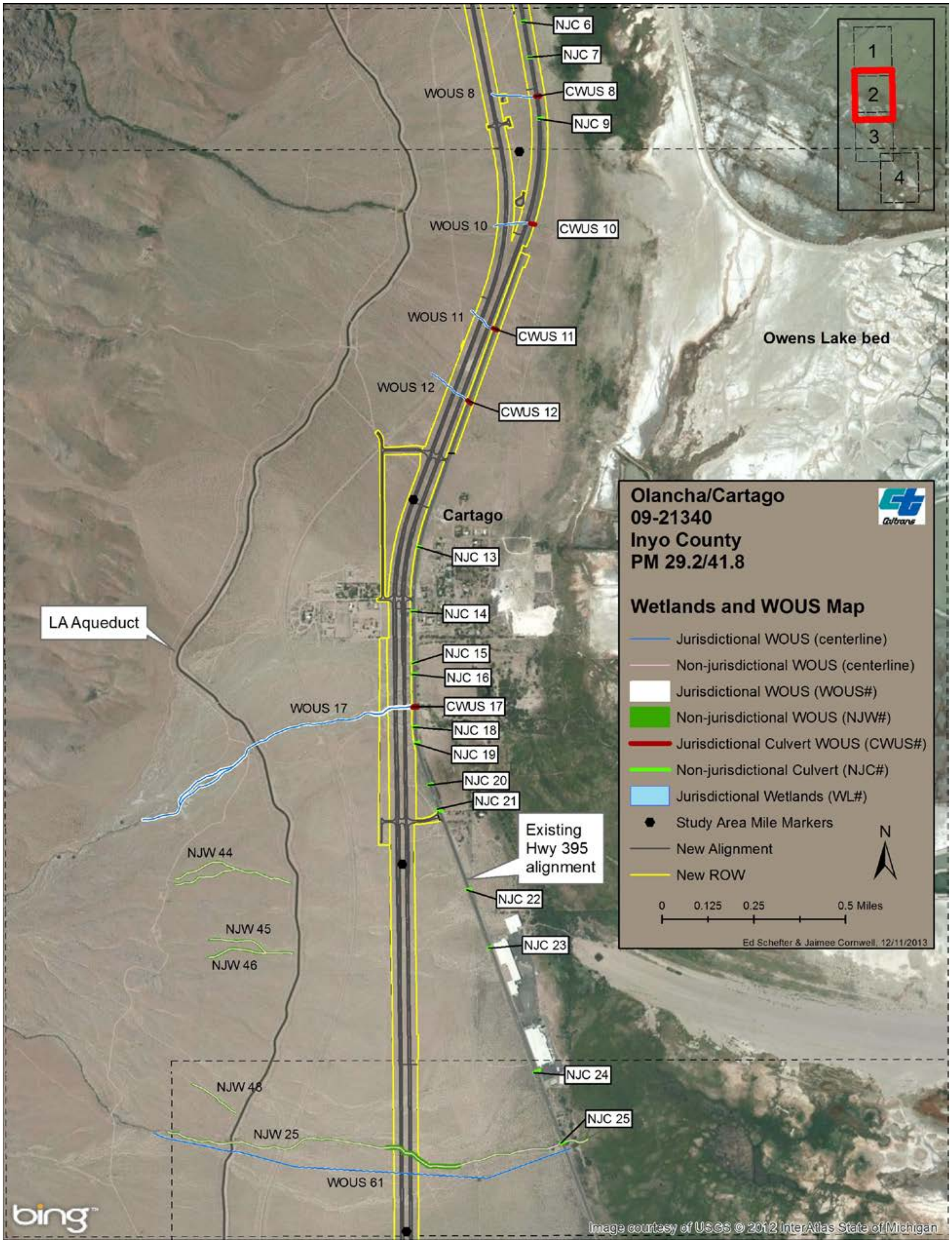
4.1.2.1. SURVEY RESULTS

There are 30.22 acres of jurisdictional wetlands and Waters of the U.S (WOUS) in the area that was covered by the surveys within the BSA. Of this total, 28.17 acres are wetlands (WL) and 2.05 acres are WOUS, or culverted waters of the US (CWUS). Please refer to Figure 9 for the mapped jurisdictional and non-jurisdictional features as they pertain to the selected 4-3 Hybrid.

Specifically, the following jurisdictional features were identified during the delineation and occupy portions of the project: 3 wetlands and 25 WOUS, some are culverted and some are not. The three jurisdictional wetlands were qualified according to the Cowardin classification system can be best described as Palustrine, emergent wetlands (Cowardin et al. 1979). For detailed information on the jurisdictional wetlands and WOUS within the project site, refer to the A *Jurisdictional Delineation Report for the Olancha/Cartago 4-Lane Project* (URS 2009).

Figure 9: Wetlands and Waters of the U.S. (WOUS) Map

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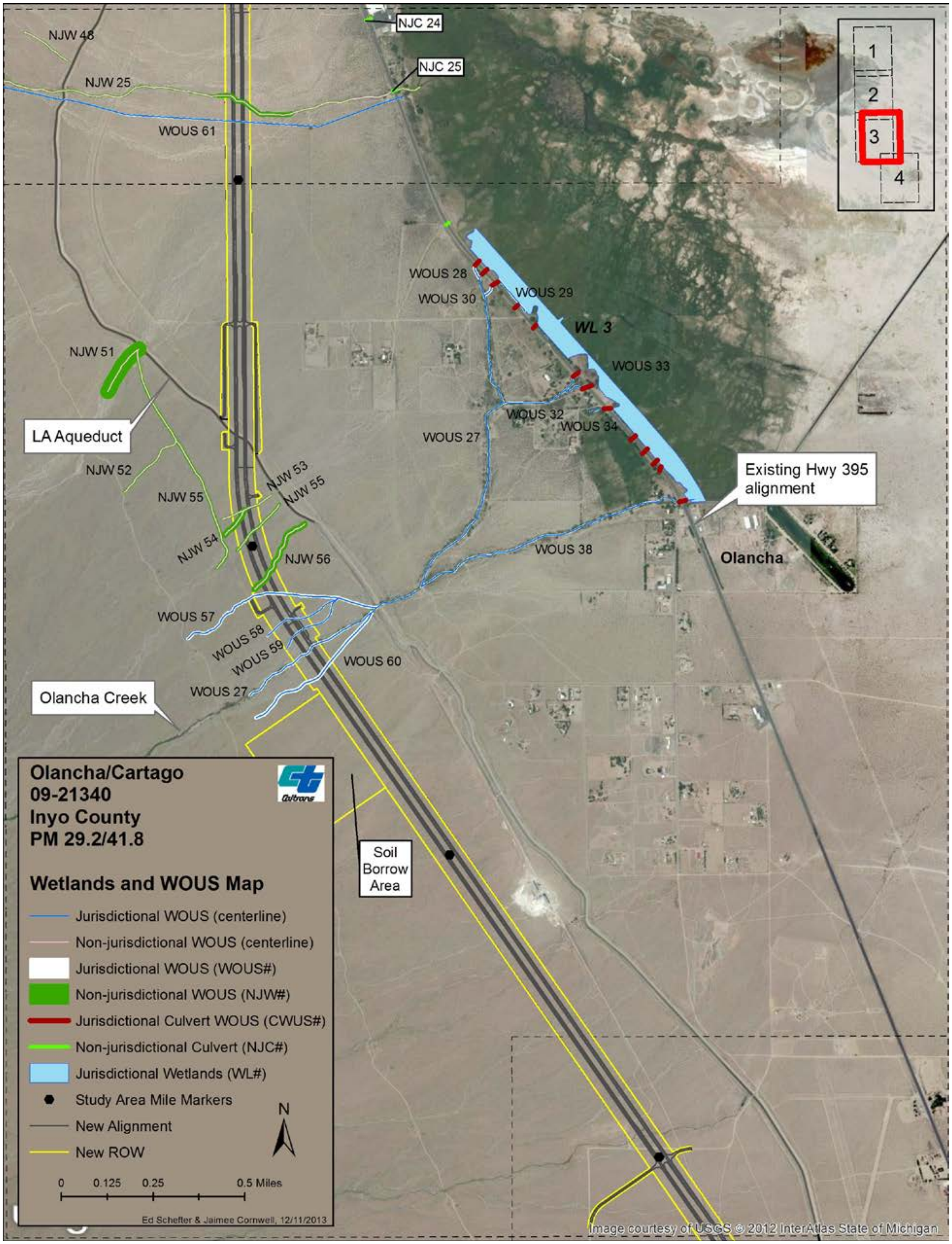
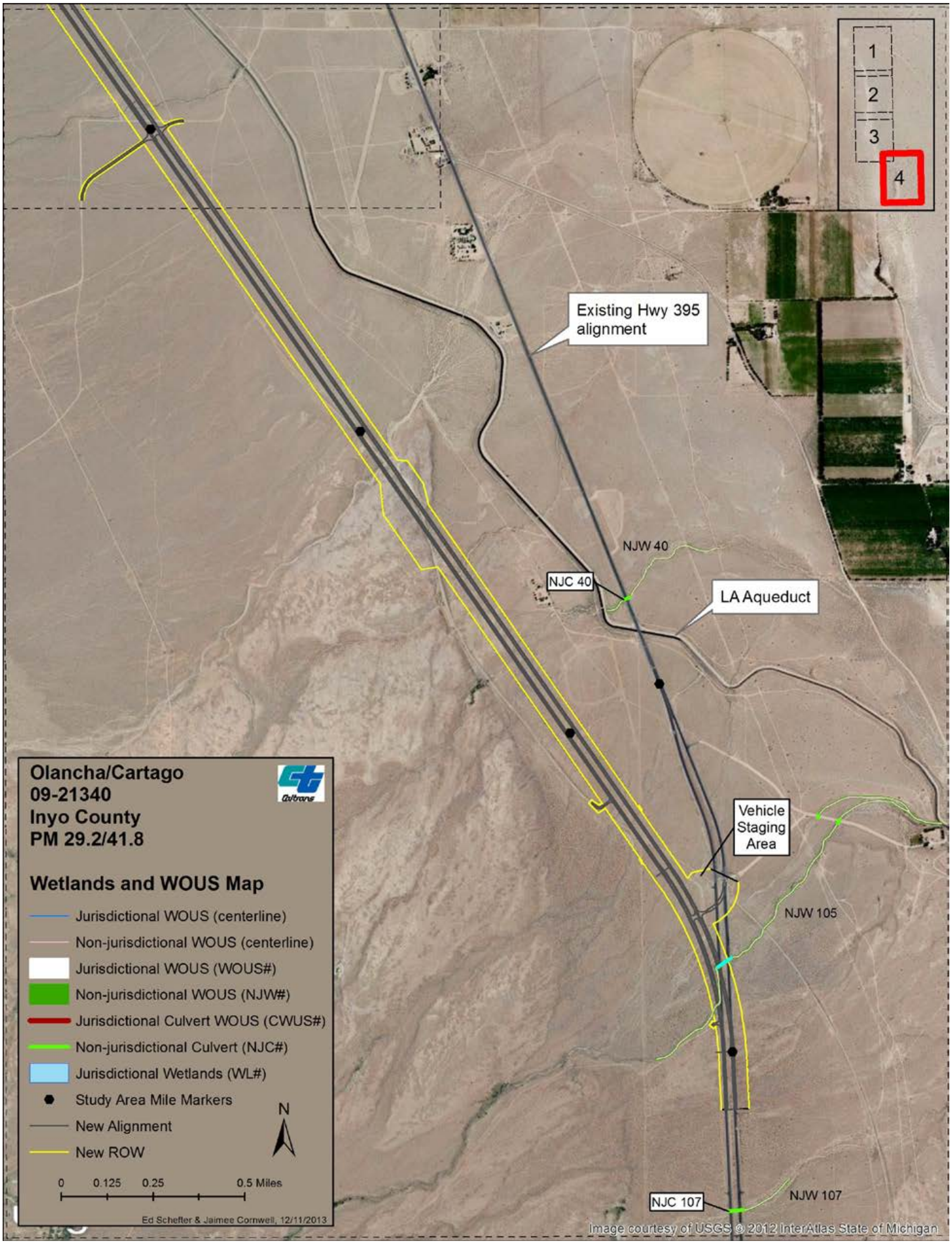
NJC 7
WOUS 8
CWUS 8
NJC 9
1
2
3
4
WOUS 10
CWUS 10
WOUS 11
CWUS 11
Owens Lake bed
WOUS 12
CWUS 12
Cartago
Olancha/Cartago
09-21340
Inyo County
PM 29.2/41.8
Wetlands and WOUS Map
Jurisdictional WOUS (centerline)
Non-jurisdictional WOUS (centerline)
Jurisdictional WOUS (WOUS#)
Non-jurisdictional WOUS (NJW#)
Jurisdictional Culvert WOUS (CWUS#)
Non-jurisdictional Culvert (NJC#)
Jurisdictional Wetlands (WL#)
Study Area Mile Markers
New Alignment
New ROW
N
0 0.125 0.25 0.5 Miles
Ed Schefter & Jaimee Cornwell, 12/11/2013
NJC 13
LA Aqueduct
NJC 14
NJC 15
NJC 16
WOUS 17
CWUS 17
NJC 18
NJC 19
NJC 20
NJC 21
Existing
Hwy 395
alignment
NJW 44
NJC 22
NJW 45
NJW 46
NJC 23
NJC 24
NJW 48
NJC 25
NJW 25
WOUS 61
bing
Image courtesy of USGS © 2012 InterAtlas State of Michigan


NJW 48
NJC 24
NJC 25
NJW 25
WOUS 61
1
2
3
4
WOUS 28
WOUS 30
WOUS 29
WL 3
NJW 51
WOUS 33
LA Aqueduct
WOUS 32
WOUS 34
WOUS 27
NJW 52
NJW 53
NJW 55
NJW 55
Existing Hwy 395 alignment
NJW 54
NJW 56
WOUS 38
Olancha
WOUS 57
WOUS 58
WOUS 59
WOUS 60
WOUS 27
Olancha Creek
Olancha/Cartago
09-21340
Inyo County
PM 29.2/41.8
Soil Borrow Area
Wetlands and WOUS Map
Jurisdictional WOUS (centerline)
Non-jurisdictional WOUS (centerline)
Jurisdictional WOUS (WOUS#)
Non-jurisdictional WOUS (NJW#)
Jurisdictional Culvert WOUS (CWUS#)
Non-jurisdictional Culvert (NJC#)
Jurisdictional Wetlands (WL#)
Study Area Mile Markers
New Alignment
New ROW
N
0 0.125 0.25 0.5 Miles
Ed Schefter & Jaimee Cornwell, 12/11/2013
Image courtesy of USGS © 2012 InterAtlas State of Michigan


1
2
3
4
Existing Hwy 395 alignment
NJW 40
NJC 40
LA Aqueduct
Vehicle Staging Area
NJW 105
NJC 107
NJW 107
Image courtesy of USGS © 2012 InterAtlas State of Michigan
Olancha/Cartago
09-21340
Inyo County
PM 29.2/41.8
Wetlands and WOUS Map
Jurisdictional WOUS (centerline)
Non-jurisdictional WOUS (centerline)
Jurisdictional WOUS (WOUS#)
Non-jurisdictional WOUS (NJW#)
Jurisdictional Culvert WOUS (CWUS#)
Non-jurisdictional Culvert (NJC#)
Jurisdictional Wetlands (WL#)
Study Area Mile Markers
New Alignment
New ROW
N
0 0.125 0.25 0.5 Miles
Ed Schefter & Jaimee Cornwell, 12/11/2013

4.1.2.2. Avoidance and Minimization Measures

To avoid impacts to the on-site wetlands and WOUS within the project site Best Management Practices (BMP's) have been included in the project design. For example, all of the on-site impact areas have been reduced to the smallest practical footprint. Culverts will be installed in areas that contain existing surface water, or are prone to surface water run-off during seasonal or intermittent storms. The installation of culverts will be seasonally timed so perennial drainages are low and ephemeral and intermittent drainages are dry. The following additional avoidance and minimization measures will also be employed:

1. Work will be conducted outside of the rainy season when flows are absent or low;

2. A stormwater pollution prevention plan will be prepared specifically for this project;

3. BMP's specifically protecting water quality will be implemented and will include the following:

    a. Installation of measures to control temporary erosion;

    b. Installation of measures to prevent debris from entering surface waters;

    c. Installation of measures in the case of a hazardous materials spill. At a minimum, a spill kit shall be kept on-site and an Emergency Response Plan shall be developed and implemented if a spill occurs. See the construction contract for the standard specifications outlining additional BMPs.

4. Any portions of jurisdictional wetlands or WOUS that will not be permanently impacted by the project will be protected with an established ESA, unless specifically determined to be unfeasible. The ESAs will be identified on the project mapping and included in the Plans, Specifications and Estimates section of the construction contract so they can be flagged or fenced on-site prior to the start of construction. A qualified project biologist will be on-site at the time of the ESA flagging or fence installation to approve the locations of the ESAs;

5. A mandatory environmental education will be provided for all construction personnel prior to the start of any ground-breaking activities to review the specific avoidance and minimization measures in place to eliminate unnecessary impacts to wetlands and WOUS on the project site;

6. Any temporary impacts to wetlands or WOUS that are not treated as permanent impacts and thus mitigated for, will be entirely restored to pre-project conditions;

4.1.2.3. PROJECT IMPACTS

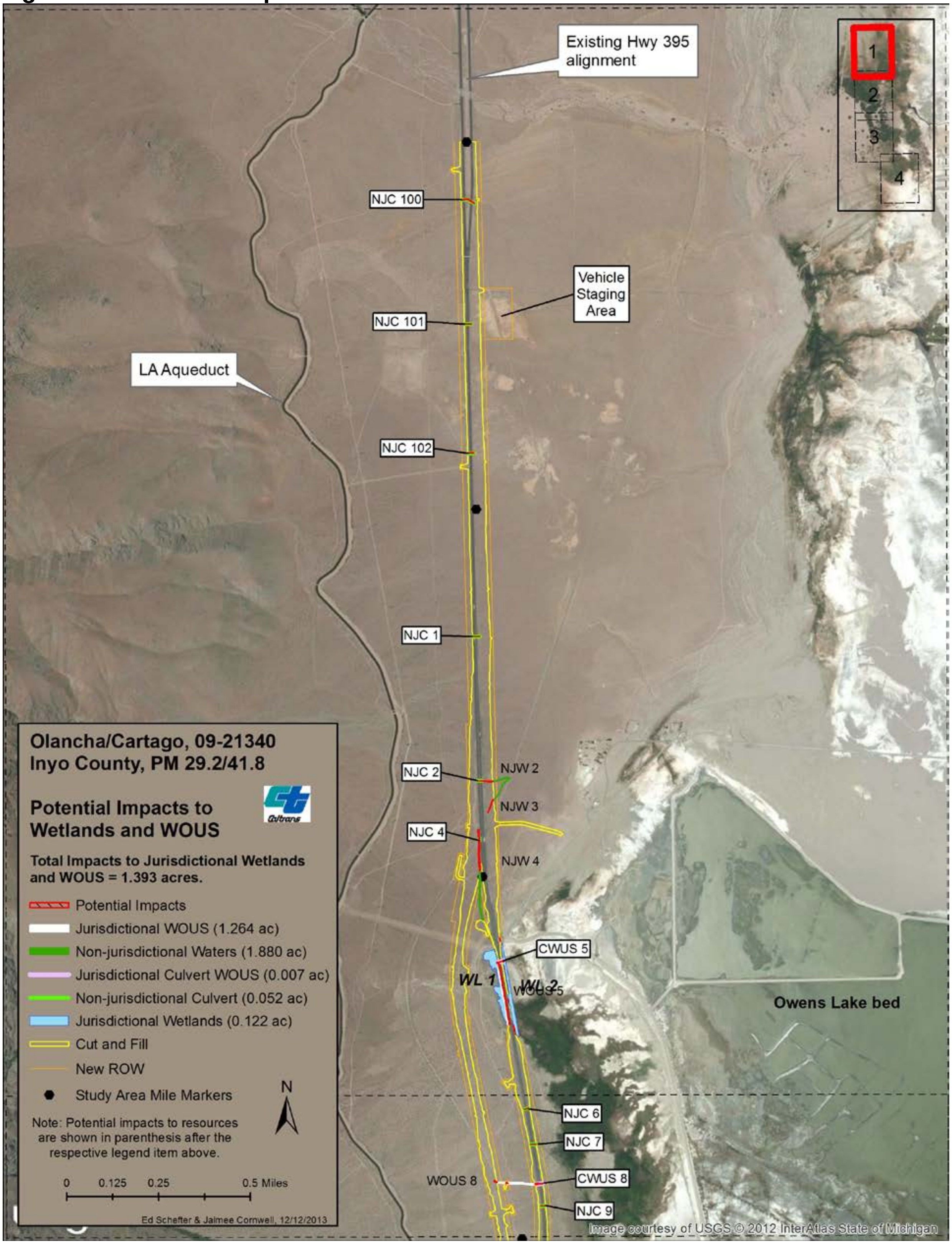
The proposed project will impact wetlands and WOUS through the placement of fill in portions of these hydrological resources in areas where culverts will be installed and/or equipped with rock slope protection (RSP) that will function as an energy dissipater.

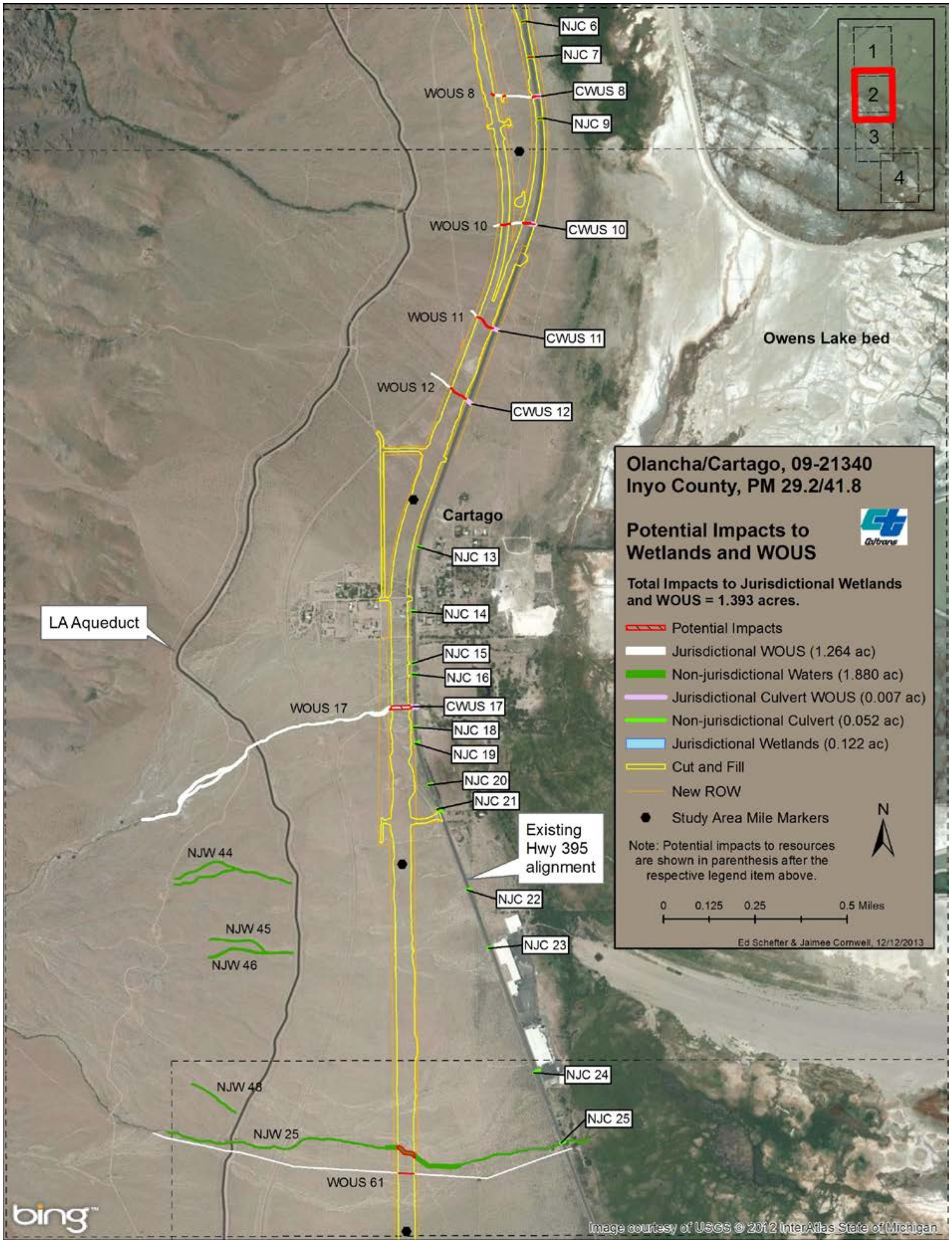
Two jurisdictional wetlands (0.122 acres) and 13 jurisdictional WOUS (1.271 acres) are located in areas that will be permanently impacted by the proposed project (Figure 10). Please refer to Table 6 below, which provides an acreage summary for impacts to each category of hydrologic resource located within the selected 4-3 Hybrid.

Table 6: Impacts to Wetlands and WOUS

Hydrologic Feature	Area (acres)	Area of Impact (acres)
Jurisdictional Wetlands	28.17	0.122
Jurisdictional WOUS	2.05	1.271
Total	30.22	1.393

Figure 10: Potential Impacts to Wetlands and WOUS

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NJC 7
WOUS 8
CWUS 8
NJC 9
WOUS 10
CWUS 10
WOUS 11
CWUS 11
WOUS 12
CWUS 12
Owens Lake bed
1
2
3
4
Cartago
NJC 13
NJC 14
LA Aqueduct
NJC 15
NJC 16
WOUS 17
CWUS 17
NJC 18
NJC 19
NJC 20
NJC 21
Existing Hwy 395 alignment
NJW 44
NJC 22
NJW 45
NJW 46
NJC 23
NJC 24
NJW 48
NJC 25
NJW 25
WOUS 61
Olancha/Cartago, 09-21340
Inyo County, PM 29.2/41.8
Potential Impacts to Wetlands and WOUS
Total Impacts to Jurisdictional Wetlands and WOUS = 1.393 acres.
Potential Impacts
Jurisdictional WOUS (1.264 ac)
Non-jurisdictional Waters (1.880 ac)
Jurisdictional Culvert WOUS (0.007 ac)
Non-jurisdictional Culvert (0.052 ac)
Jurisdictional Wetlands (0.122 ac)
Cut and Fill
New ROW
Study Area Mile Markers
N
Note: Potential impacts to resources are shown in parenthesis after the respective legend item above.
0 0.125 0.25 0.5 Miles
Ed Schefter & Jaimee Cornwell, 12/12/2013
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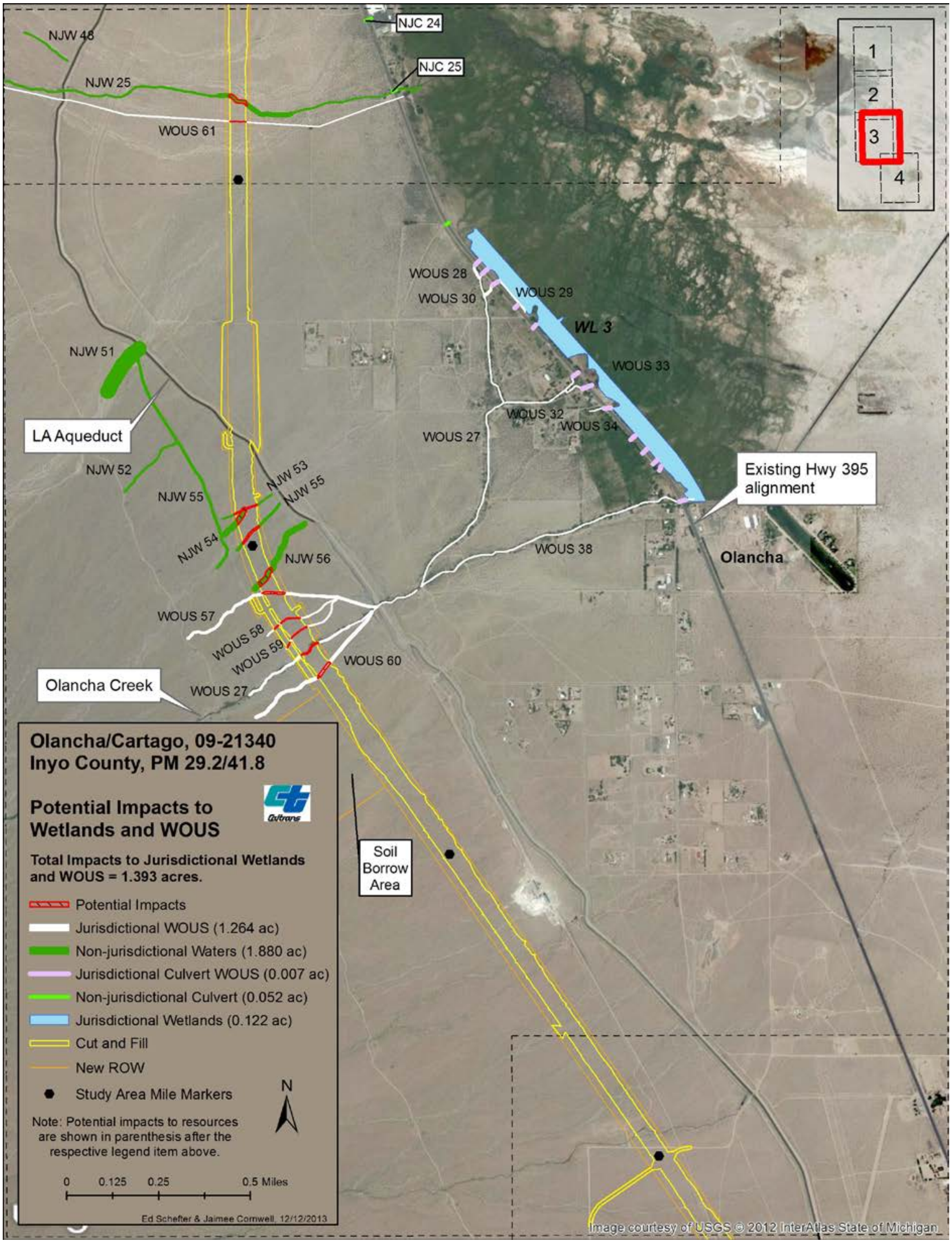
Image courtesy of USGS © 2012 InterAtlas State of Michigan


NJC 24
NJW 48
NJC 25
NJW 25
WOUS 61
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WOUS 28
WOUS 30
WOUS 29
WL 3
NJW 51
WOUS 33
WOUS 32
WOUS 34
WOUS 27
LA Aqueduct
NJW 52
NJW 53
NJW 55
NJW 55
Existing Hwy 395 alignment
NJW 54
NJW 56
WOUS 38
Olancha
WOUS 57
WOUS 58
WOUS 59
WOUS 60
Olancha Creek
WOUS 27
Olancha/Cartago, 09-21340
Inyo County, PM 29.2/41.8
Potential Impacts to Wetlands and WOUS
Total Impacts to Jurisdictional Wetlands and WOUS = 1.393 acres.
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Jurisdictional WOUS (1.264 ac)
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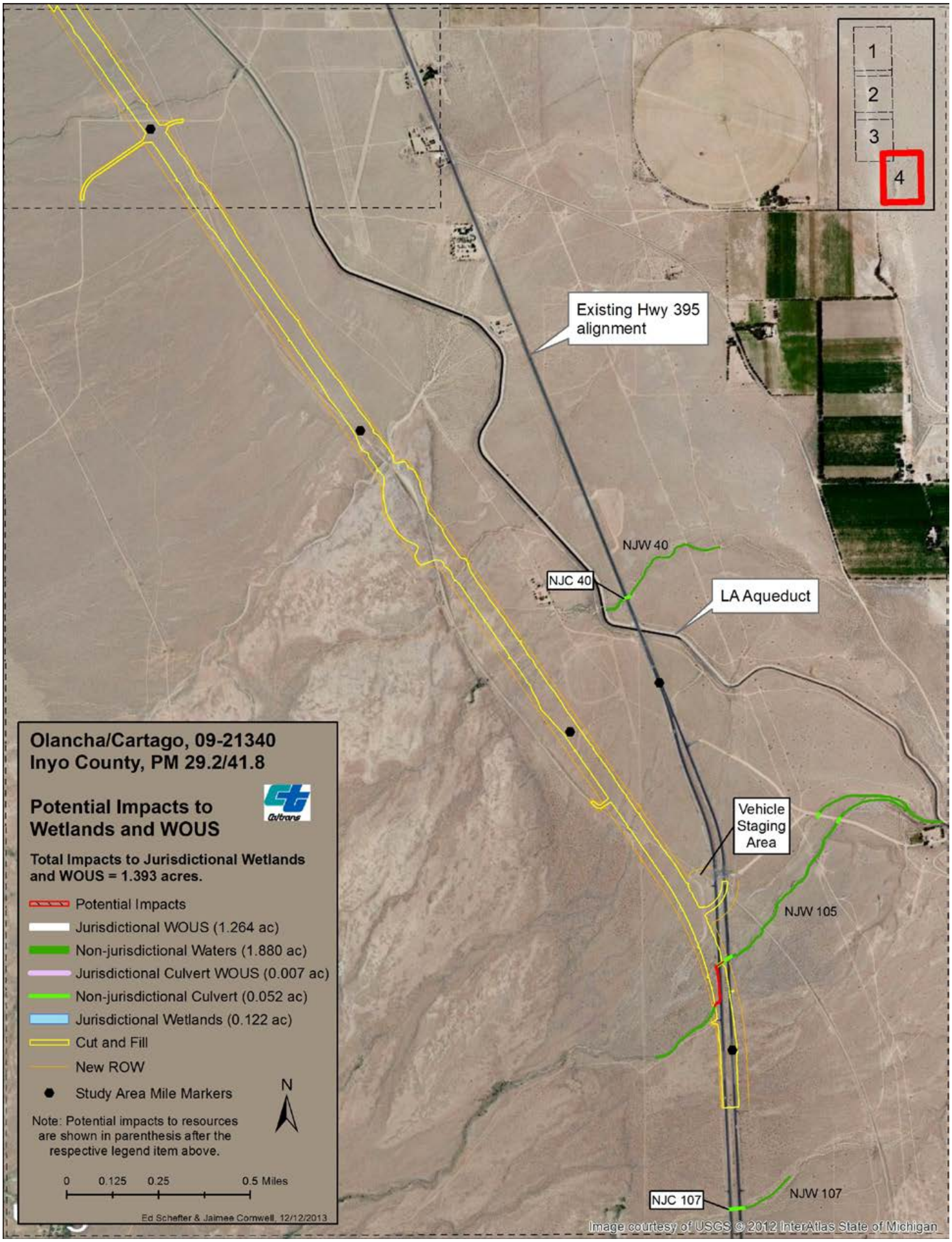
Jurisdictional Culvert WOUS (0.007 ac)
Non-jurisdictional Culvert (0.052 ac)
Jurisdictional Wetlands (0.122 ac)
Cut and Fill
New ROW
Study Area Mile Markers
N
Note: Potential impacts to resources are shown in parenthesis after the respective legend item above.
0 0.125 0.25 0.5 Miles
Ed Schefter & Jaimee Cornwell, 12/12/2013
Soil Borrow Area
Image courtesy of USGS © 2012 InterAtlas State of Michigan


1
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3
4
Existing Hwy 395 alignment
NJW 40
NJC 40
LA Aqueduct
Vehicle Staging Area
NJW 105
NJC 107
NJW 107
Olancha/Cartago, 09-21340
Inyo County, PM 29.2/41.8
Potential Impacts to Wetlands and WOUS
Caltrans
Total Impacts to Jurisdictional Wetlands and WOUS = 1.393 acres.
Potential Impacts
Jurisdictional WOUS (1.264 ac)
Non-jurisdictional Waters (1.880 ac)
Jurisdictional Culvert WOUS (0.007 ac)
Non-jurisdictional Culvert (0.052 ac)
Jurisdictional Wetlands (0.122 ac)
Cut and Fill
New ROW
Study Area Mile Markers
N
Note: Potential impacts to resources are shown in parenthesis after the respective legend item above.
0 0.125 0.25 0.5 Miles
Ed Schefter & Jaimee Cornwell, 12/12/2013
Image courtesy of USGS © 2012 InterAtlas State of Michigan

4.1.2.4. COMPENSATORY MITIGATION

Compensatory mitigation for impacts to jurisdictional wetlands and WOUS will be implemented to ensure no net loss of wetland or WOUS habitat. Mitigation will be accomplished off-site and is being proposed at a 1:1 ratio. Mitigation for these resources will be provided through the purchase of in-lieu fee credits or through wetland and WOUS creation or enhancement, as approved by the USACE and Regional Water Quality Control Board.

4.2. Special Status Plant Species

4.2.1. Discussion of Crowned Muilla

Crowned muilla (*Muilla coronata*) is a perennial herb that belongs to the Brodiaea family (Themidaceae). It is native to California and Nevada. This species is found in creosote bush scrub, Joshua tree woodlands and pinyon-juniper woodlands.

Crowned muilla is ranked 4.2 on the CNPS rare and endangered plant inventory (CNPS 2013). The 4-rank status identifies this species as having a limited distribution and the 0.2 further qualifies the plant as being fairly threatened in the state of California. Although plants with a “4” rank status do not meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the Fish and Game Code, many are locally significant. Therefore, the CNPS recommends that “4” ranked plants be evaluated for consideration during preparation of environmental documents relating to CEQA. Caltrans current policy is to only consider the effects of a proposed project on plants with: “1A” rank status- those plants presumed extinct in California; “1B” rank status- plants rare, threatened or endangered in California and elsewhere; and “2” rank status- plants rare, threatened or endangered in California, but more common elsewhere. However, because this species was observed and studied earlier in the project development process, it will be considered here.

4.2.1.1. SURVEY RESULTS

This species was observed during the 2001 and 2008 botanical surveys. In addition, this was the only species of sensitive plant that was observed during all of the project surveys.

4.2.1.2. AVOIDANCE AND MINIMIZATION MEASURES

Although the selected 4-3 Hybrid will not pose impacts the observed community of crowned muilla, the observed community was likely to have been impacted by other previously proposed project alternatives. The known population of this species will be protected from construction activities in its near vicinity through the establishment of an Environmentally Sensitive Area (ESA). For additional information regarding the population of crowned muilla observed in the project area, including the specific survey results, please refer to the *Botanical Survey Report*, dated October 6, 2008.

4.2.1.3. PROJECT IMPACTS

As previously noted, ground disturbing activities conducted for the selected 4-3 Hybrid will not affect the observed population of crowned muilla so no impacts are anticipated for this species.

4.2.1.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed.

4.2.2. Discussion of Sanicle cymopterus

Sanicle cymopterus (*Cymopterus ripleyi* var. *saniculoides*) is a perennial herb that belongs to the carrot family (Apiaceae). This species is native to both California and Nevada and is found in creosote bush scrub and Joshua Tree Woodlands. Common threats to this species include: grazing, vehicles and mining.

Sanicle cymopterus is ranked 1B.2 by the CNPS rare and endangered plant inventory. The 1B rank status identifies the species as being rare, threatened or endangered in Californian, and elsewhere. The 0.2 describes this plant as being fairly threatened in the state of California (CNPS 2013). This species is also included on the BLM Sensitive Plant list (BLM 2013).

4.2.2.1. SURVEY RESULTS

This species was surveyed for during the 2001 botanical surveys completed by ESRP, covering proposed Alternatives 1, 2, 2a, 3 and 3a. This plant was again surveyed for during the 2008 botanical surveys which covered lands occupied by Alternative 4. If Sanciale cymopterus were present within any portion of the project, or its immediate vicinity, it is likely it would have been observed and identified during one of the botanical survey site visits. Because this species was not found during any of the botanical surveys, there is a low potential for its occurrence within the project site.

4.2.2.2. Avoidance and Minimization Measures

Sanicle cymopterus is not expected to occur within the project site; therefore, no avoidance or minimization measures are being proposed.

4.2.2.3. Project Impacts

Sanicle cymopterus is not expected to occur in the project site so no impacts to this species are anticipated.

4.2.2.4. Compensatory Mitigation

No compensatory mitigation is proposed.

4.2.3. Discussion of Mojave tarplant

The Mojave tarplant (*Deinandra mohavensis*) is an annual herb that belongs to the aster family (Asteraceae). The Mojave tarplant is native to, and present in, California alone. This species is found in mesic, or moist, areas in chaparral, costal scrub and riparian scrub habitats. This species is threatened by: hydrological alterations, grazing, development, recreational activities, road maintenance and vehicles.

The Mojave tarplant is a state-endangered species, as designated by the CDFW, and has a 1B.1 rank status according to the CNPS rare and endangered plant inventory. The 1B rank describes the plant as being rare, threatened or endangered in California and elsewhere and the 0.1 rank identifies the plant as being seriously threatened in California (CNPS 2013). This species has also been identified as a BLM-sensitive plant (BLM 2013).

4.2.3.1. Survey Results

Although focused surveys for this species were not conducted, the formal botanical surveys that were conducted both in 2001 and 2008 were comprehensive and all plant species observed were identified to a taxonomic level, either genus or species, to ensure they were not special-status. Furthermore, not only was this species not observed, but no species of tar plant were identified. Because this species was not observed during either of the botanical surveys it is not likely to occur within the project site.

4.2.3.2. Avoidance and Minimization Measures

Mojave tarplant is not expected to occur within the project site; therefore, no avoidance or minimization measures are being proposed.

4.2.3.3. PROJECT IMPACTS

Mojave tarplant is not expected to occur within the project site so no impacts to this species are anticipated.

4.2.3.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed.

4.2.4. Discussion of Limestone Monkeyflower

The limestone monkeyflower (*Erythranthe calcicola*) is an annual herb that belongs to the lopseed family (Phrymaceae). The limestone monkeyflower is found in the northern Mojave Desert, in eastern California and southwestern Nevada. This species was first described in 2012 and was previously treated as the Carson Valley monkeyflower (*E. montioides*); however, it was recently determined to be a separate species based on differences in leaf shape and calyx morphology (Fraga 2012). There are only 15 documented occurrence records for this new species and as its name implies, it occurs almost exclusively on soils derived of limestone. Furthermore, the majority of occurrence records for this species are from locations within and near Death Valley National Park. The potential threats identified for this species are historical mining operations and invasive plants.

The limestone monkeyflower has a 1B.3 rank status according to the CNPS rare and endangered plant inventory. The 1B rank describes this plant as being rare in California and elsewhere and the 0.3 rank identifies the plant as not being very threatened in California (CNPS 2013). This species is also included on the BLM Sensitive Plant list (BLM 2013).

4.2.4.1. SURVEY RESULTS

Although focused surveys for this species were not conducted, the formal botanical surveys that were conducted in 2001 and 2008 were comprehensive and all plant species observed were identified to a taxonomic level, either genus or species, to ensure they were not special-status. Furthermore, two species of monkeyflower (common monkeyflower (*Mimulus guttatus*) and downy monkeyflower (*M. pilosus*)) were identified during the surveys; however, neither species are morphologically similar to the Carson Valley monkeyflower (*E. montioides*) or the newly described limestone monkeyflower (*E. calcicola*). The two species identified on the project site were deemed unsimilar to the rare species named above, due to the presence of a relatively diagnostic difference between the unequal calyx lobes of the common and downy monkeyflowers (*M. guttatus* and *M. pilosus* respectively) and the equal calyx lobes of both the Carson Valley and limestone monkeyflowers (*E. montioides* and *E.*

calcicola respectively). Because the two species identified during the botanical surveys were unsimilar to the above-mentioned rare species of monkeyflower (*Erythranthe* sp.) it is not likely that the limestone monkeyflower was misidentified as a *Mimulus* sp., or that it occurs within the project site.

4.2.4.2. Avoidance and Minimization Measures

Limestone monkeyflower is not expected to occur within the project site; therefore, no avoidance or minimization measures are being proposed.

4.2.4.3. Project Impacts

Limestone monkeyflower is not expected to occur within the project site so no impacts to this species are anticipated.

4.2.4.4. Compensatory Mitigation

No compensatory mitigation is proposed.

4.2.5. Discussion of Creamy Blazing Star

Creamy blazing star (*Mentzelia tridentata*) is an annual herb that is a member of the eveningstar family (Loasaceae). This species is native to California alone and is found in rocky, gravelly or sandy soils in Mojavean desert scrub habitat. The most common threats to this species are vehicles, mining and grazing (CNPS 2013).

The creamy blazing star is ranked 1B.3 on the CNPS rare and endangered plant inventory. The 1B rank status identifies the plant as being rare, threatened or endangered in California and elsewhere. The 0.3 further qualifies this plant as being not very threatened in the state of California. This species is also included on the BLM Sensitive Plant list (BLM 2013).

4.2.5.1. Survey Results

Focused surveys for the creamy blazing star were conducted in 2008; however, it was not observed on the project site. If it were present at the time of the surveys, it is likely it would have been observed. Because this species was not observed during the appropriately timed survey, it is unlikely that it is present.

4.2.5.2. Avoidance and Minimization Measures

Creamy blazing star is not expected to occur on the project site; therefore no avoidance or minimization measures are being proposed.

4.2.5.3. PROJECT IMPACTS

Creamy blazing star is not expected to occur on the project site so no impacts to this species are anticipated.

4.2.5.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed.

4.2.6. Discussion of Nevada Oryctes

Nevada oryctes (*Oryctes nevadensis*) is an annual herb that belongs to the nightshade family (Solanaceae). This species is native to California and Nevada. It is found in creosote bush scrub and shadscale shrub communities. The major threat to this species is grazing.

Nevada oryctes is ranked 2B.1 on the CNPS rare and endangered plant inventory. The 2B- rank indicates this species is rare, threatened or endangered in California, but more common elsewhere and the 0.1 further describes the species as seriously threatened in California (CNPS 2013). Common threats to this species include: grazing, off-road vehicle (ORV) use, foot traffic/trampling, development (CNPS 2013).

4.2.6.1. SURVEY RESULTS

Nevada oryctes was surveyed for in 2001, but was not found even during the appropriately timed surveys. Bagley and Leatherman conducted surveys for this species in loose, sandy soils located east of the project site, but did not find this species even though there were favorable growing conditions in 1998 (1999). Furthermore, the soils in the area south of Owens Lake are more suitable for this species than the soils within the study area and yet, the southernmost documented locality is southeast of Lone Pine, approximately 12 mile northeast of the project site (CNDDB 2002 & 2013). Given the fact that Bagley and Leatherman did not find this species during their surveys, Nevada oryctes is not likely to be present in the study area.

4.2.6.2. AVOIDANCE AND MINIMIZATION MEASURES

Nevada oryctes is not expected to occur within the project site; therefore, no avoidance or minimization efforts are being proposed.

4.2.6.3. PROJECT IMPACTS

Nevada oryctes is not expected to occur within the project site so no impacts to this species are anticipated.

4.2.6.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed.

4.2.7. Discussion of Inyo Phacelia

Inyo phacelia (*Phacelia inyoensis*) is an annual herb that is a member of the Borage family (Boraginaceae). This species is native to California and is limited to California alone. It is commonly located in alkaline wet meadows and seeps.

Inyo phacelia is ranked 1B.2 on the CNPS rare and endangered plant inventory. The 1B- rank indicates this species is rare, threatened or endangered in California and elsewhere. The 0.2 further qualifies the plant as being fairly threatened in California (CNPS 2013). This species is also included on the BLM Sensitive Plant list (BLM 2013). Common threats to this species include: trampling, grazing and vehicles.

4.2.7.1. SURVEY RESULTS

Inyo phacelia was surveyed for in 2001 during the appropriately-timed formal botanical surveys and then again during an appropriately-timed informal follow-up survey in the northern portion of the project site. Although focused surveys for this plant were conducted, it was determined there are no alkali soils on the project site (SWCA 2008).

4.2.7.2. AVOIDANCE AND MINIMIZATION MEASURES

Inyo phacelia is not expected to occur in the project site; therefore, no avoidance or minimization efforts being proposed.

4.2.7.3. PROJECT IMPACTS

Inyo phacelia is not expected to occur in the project site so no impacts to this species are anticipated.

4.2.7.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed.

4.2.8. Discussion of Charolette's Phacelia

Charlotte's phacelia (*Phacelia nashiana*) is an annual herb that belongs to the Borage family (Boraginaceae). This species is native to California and is limited to California alone. Charlotte's phacelia is found in Mojavean desert scrub, Joshua Tree woodlands and pinyon-juniper woodlands and is most commonly found in sandy, granitic soils.

Charlotte's phacelia is ranked 1B.2 on the CNPS rare and endangered plant inventory. The 1B rank status identifies the plant as being rare, threatened or endangered in

California and elsewhere. The 0.2 further qualifies this plant as being fairly threatened in California (CNPS 2013). This species is also included on the BLM Sensitive Plant list (BLM 2013).

4.2.8.1. SURVEY RESULTS

Charlotte's phacelia was surveyed for during both of the formal botanical surveys conducted in 2001 and 2008. However, this species was not observed during either survey, nor were any species of phacelia. If this species were present in the project site it is likely it would have been observed and identified during the formal botanical surveys; therefore there is a low probability that this species occurs on the project.

4.2.8.2. AVOIDANCE AND MINIMIZATION MEASURES

Charlotte's phacelia is not expected to occur within the project; therefore, no avoidance or minimization efforts are being proposed.

4.2.8.3. PROJECT IMPACTS

Charlotte's phacelia is not expected to occur within the project so no impacts to this species are anticipated.

4.2.8.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed.

4.3. Special Status Animal Species

4.3.1. Discussion of the Northern Sagebrush Lizard

The northern sagebrush lizard (*Sceloporus graciosus graciosus*) is a BLM-sensitive sub-species of lizard that ranges from southwestern North Dakota to southeastern Oregon and southward to northwestern New Mexico (Northern Prairie Wildlife Research Center 2014). This subspecies lives on desert floors, mountain slopes, forested slopes and open flatlands in sagebrush and other types of shrublands. The sagebrush lizard (*Sceloporus graciosus*) species is found at elevations between 500 and 10,500 feet above sea level (Stebbins 2003).

The northern sagebrush lizard subspecies is diurnal and is active between late April and mid-September, hibernating during the winter. Northern sagebrush lizards mate between the months of May and mid-July. Females typically lay one clutch of approximately 2 to 7 eggs, in loose soils under the base of a shrub, and hatchlings are born in mid-August. This subspecies eats insects and is known to be easily frightened and prone to hiding, which makes observations less common. Known threats to this species include: cattle grazing, hunting/target shooting, loss of habitat due to conversion to cropland, oil developments and garbage dumping and aerial spraying of insecticide, which reduces the lizard's available prey.

4.3.1.1. Survey Results

Focused surveys for the northern sagebrush lizard were not conducted.

4.3.1.2. Avoidance and Minimization Measures

The pre-construction surveys will include this species. If any individual northern sagebrush lizards are observed a GPS point will be taken and any suitable-sized burrows found in close proximity to the point will be avoided, as feasible. In addition, it is expected that any individuals would leave an area prior to becoming injured once construction activities begin and project equipment is in the area.

4.3.1.3. Project Impacts

No impacts to this species are anticipated.

4.3.1.4. Compensatory Mitigation

No compensatory mitigation is being specifically proposed for this species; however, Caltrans anticipates that the land used to compensate for the 680.25 acres of impacted desert tortoise habitat will also benefit the northern sagebrush lizard.

4.3.2. Discussion of the Desert Tortoise

The desert tortoise (*Gopherus agassizii*) is a federally- and state-threatened species that is determined to have been in existence for approximately 15 to 20 million years (National Park Service, Joshua Tree National Park 2013). The desert tortoise has an average life span of 80 years; however, some individuals can live to be approximately one hundred years old (BLM, California Desert District 2007).

In California, the desert tortoise is widely distributed in the Mojave and Sonoran deserts within various desert scrub habitats such as: Mojave creosote bush scrub, succulent scrub, cheesebush scrub, blackbush scrub, hopsage scrub, shadscale scrub, microphyll woodland and Mojave atriplex-allscale communities. The desert tortoise has been recorded at elevations ranging from below sea level up to 7,300 feet above mean sea level (Luckenbach 1982). Desert tortoise' can occupy an approximate 1.5 square miles of habitat within their lifetime and have been known to make periodic forays, covering more than 7 miles at a time (Berry 1986).

Desert tortoise' are viewed as an indicator species of the desert community, reflecting the overall health of the ecosystem, as well as the status of other species within the ecosystem, many of which have been shown to use tortoise burrows (Environmental Protection Agency, California Resources Agency 2002; Gainger 2008, Grover and DeFalco 1995, Luchenbach 1982, Vaughn 1984). In California, tortoise habitat has been reduced by over 50 percent since the 1920's and numbers within the western Mojave population are estimated to have dropped by almost 90 percent since 1940 (Berry 1984). The desert tortoise' range has declined due to habitat loss, fragmentation and/or degradation from human-induced development, disease, road kills, poor grazing management, invasion of habitat by exotic species of plants, and collecting (NatureServe Explorer 2013).

The desert tortoise excavates shelters (burrows, dens, pallets and non-burrows) in the soil that are used for both hibernation and aestivation (Burge 1978). Desert tortoise' are estimated to spend over 95 percent of their lives underground (Nagy and Medica 1986). Tortoise shelters can be as much as 30 feet in length and can be occupied independently or communally (Woodbury and Hardy 1948).

Desert tortoise' are most active in the spring, when they emerge to forage on grasses, wildflowers, cactus pads and wild fruit (National Park Service, Joshua Tree National Park. 2013). Although most active in the spring, tortoise' may emerge at any time of the year and are known to emerge from shelters when temperatures and precipitation are favorable. Desert tortoise' have been shown to dig catchment basins in the soil, which are used to collect rainwater (Defenders of Wildlife 2013). Desert tortoise' are additionally adapted to conserve water and can survive for over a year without access to free water (Nagy and Medica 1986).

The desert tortoise reaches sexual maturity between thirteen to twenty years of age (Turner et al. 1984; Germano 1994). Mating occurs in April and May, as well as from August to October (Rostal et al. 1994). Tortoise most commonly lay eggs from May to early July and the average clutch size is three to seven eggs. Tortoise may have up to three clutches per year, depending on the environmental conditions of the current and previous year (Turner et al. 1984, 1986).

4.3.2.1. SURVEY RESULTS

2012 Survey Results

The BSA consists of lands located west of the existing alignment at the southern end of the project (PM 29.2), continuing northward to an area just south of the town of Cartago, at which point the new alignment veers northeast and closely follows, and in some places merges with, the existing alignment at the northern end of the project site (PM 41.8). ECORP Consulting, Inc. completed surveys for the desert tortoise during October and November 2012. The *Desert Tortoise Survey Report* shows a cluster of recent (Class 1-2) and older (Class 3-5) tortoise burrows and scat, located in the southern portion of the project site where the new alignment begins to veer westward from the existing alignment (ECORP 2012). There are approximately six additional older burrows, located within or along the new alignment as it heads northward up to the location of Olancha Creek. Immediately north of Olancha Creek there is another cluster of both recent and older tortoise burrows, and scat, within and around the new alignment. There is one more recent burrow that is just south of the location where the new alignment will join with the existing alignment near Cartago. Continuing northward beyond this location, no recent burrows or scat were observed; however, two older burrows were found within the BSA, and adjacent to the existing Hwy. 395 alignment, where the roadbed abuts the margin of the dry Owens Lake bed.

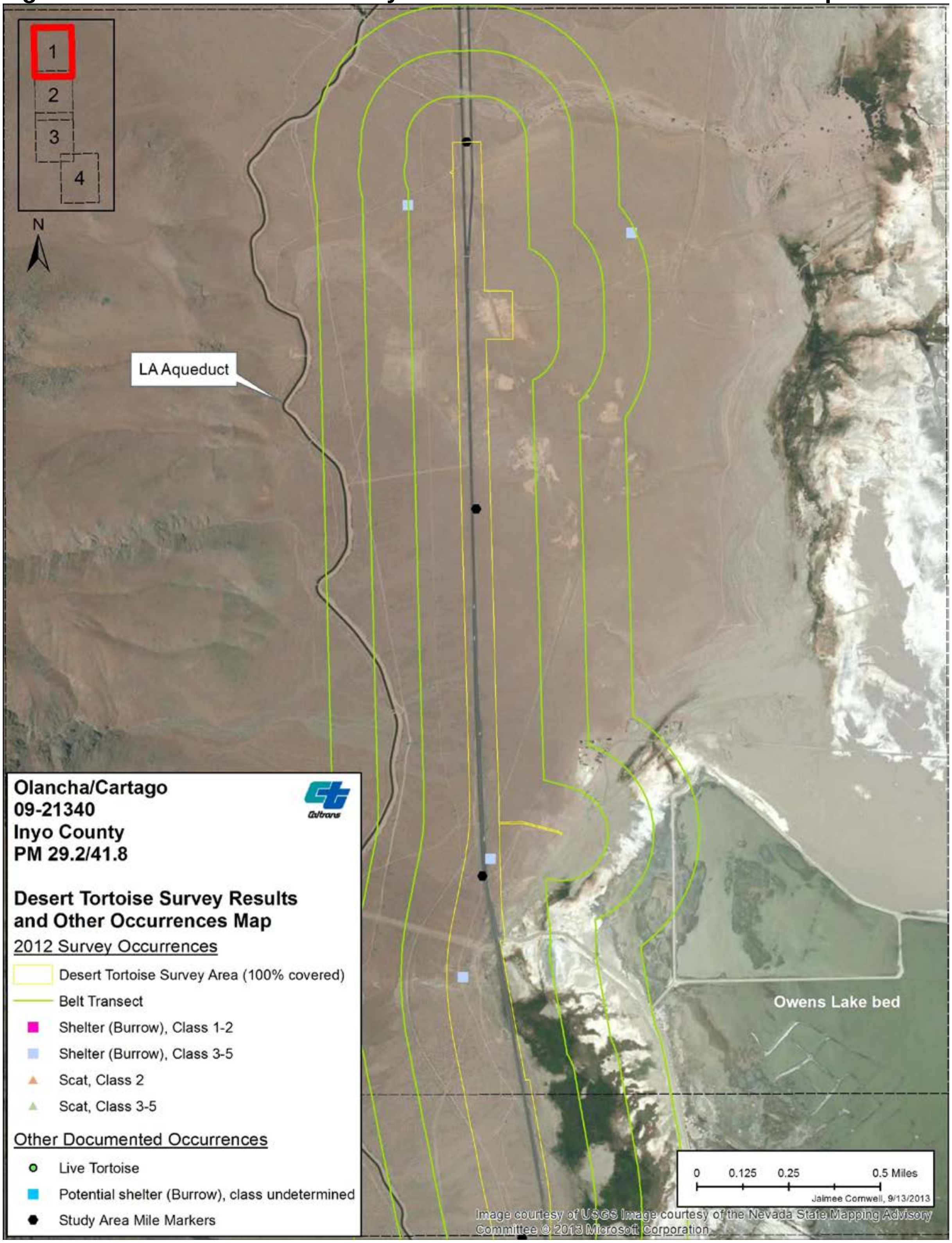
Previous Survey Results

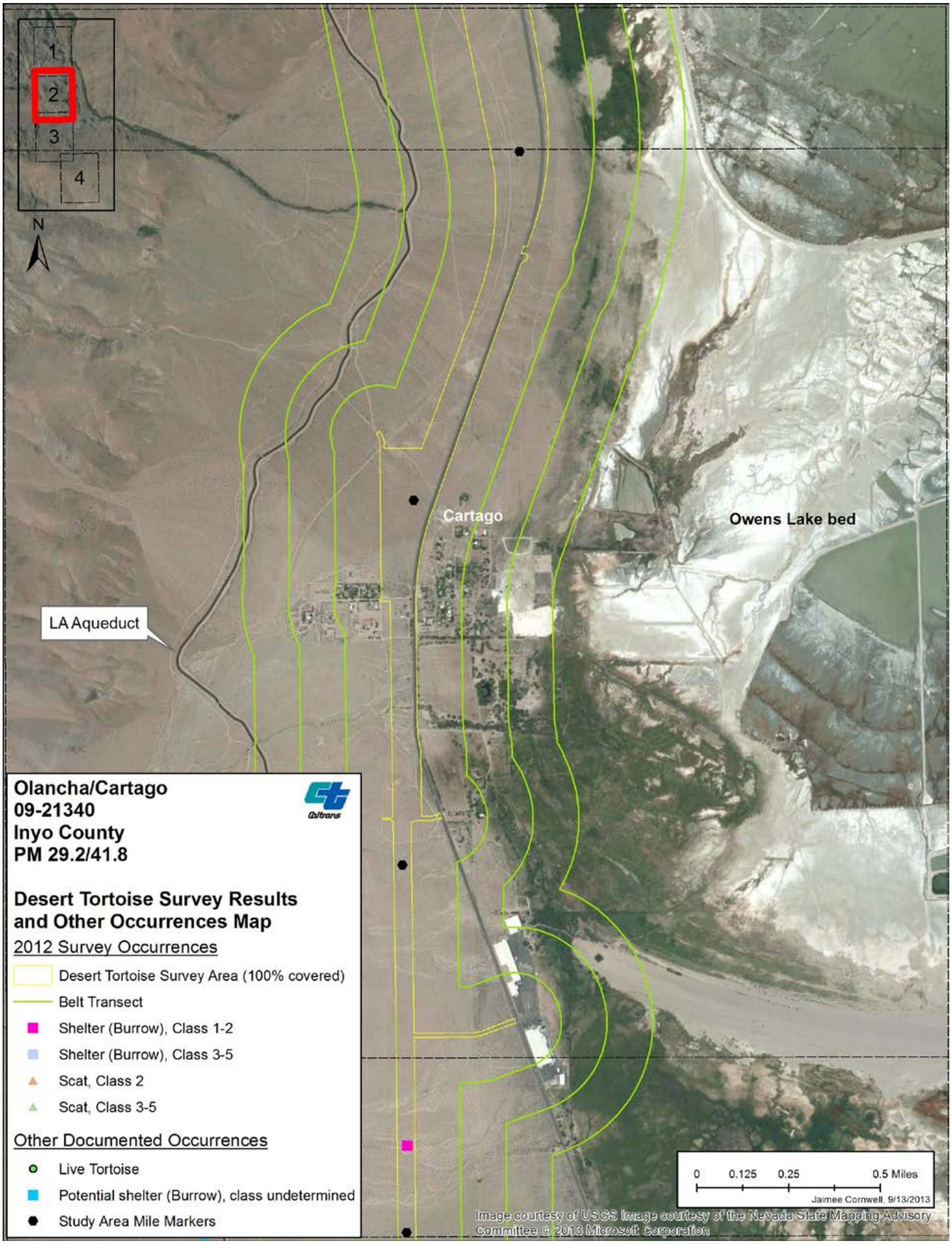
As previously mentioned, the 2001 desert tortoise surveys covered parcels located west of the existing Hwy 395 alignment and for the most part, east of the location of the selected 4-3 Hybrid. Although no tortoise or tortoise sign were observed during the 2001 surveys, a local resident provided photos and an account of an adult tortoise observed along Walker Canyon Road on February 28th and 29th, 2001. At the time, based on previous survey efforts (BLM- late 1970's, 1998 and 1999 and LADWP-1984) yielding negative results in the vicinity of the project site, coupled with the results of the current surveys, as well as the size and apparent old age of the tortoise observed on Walker Canyon Road, the individual was assumed to be an escaped captive pet.

In 2008, other desert tortoise sightings and observations of sign were documented by Caltrans Archaeological survey crew-members during surveys conducted for the previously proposed Alternative 4, also referred to as the "All West Alternative." During those surveys, three live tortoises were observed, as were approximately four potential tortoise burrows. In addition, within the past five years, data points have been recorded by fire crew members from the Ridgecrest BLM Office for an additional four live tortoise' sightings.

Please refer to Figure 11 for the mapped results of the 2012 desert tortoise surveys and other occurrence locations in the vicinity of the project site.

Figure 11: Desert Tortoise Survey Results and Other Occurrences Map

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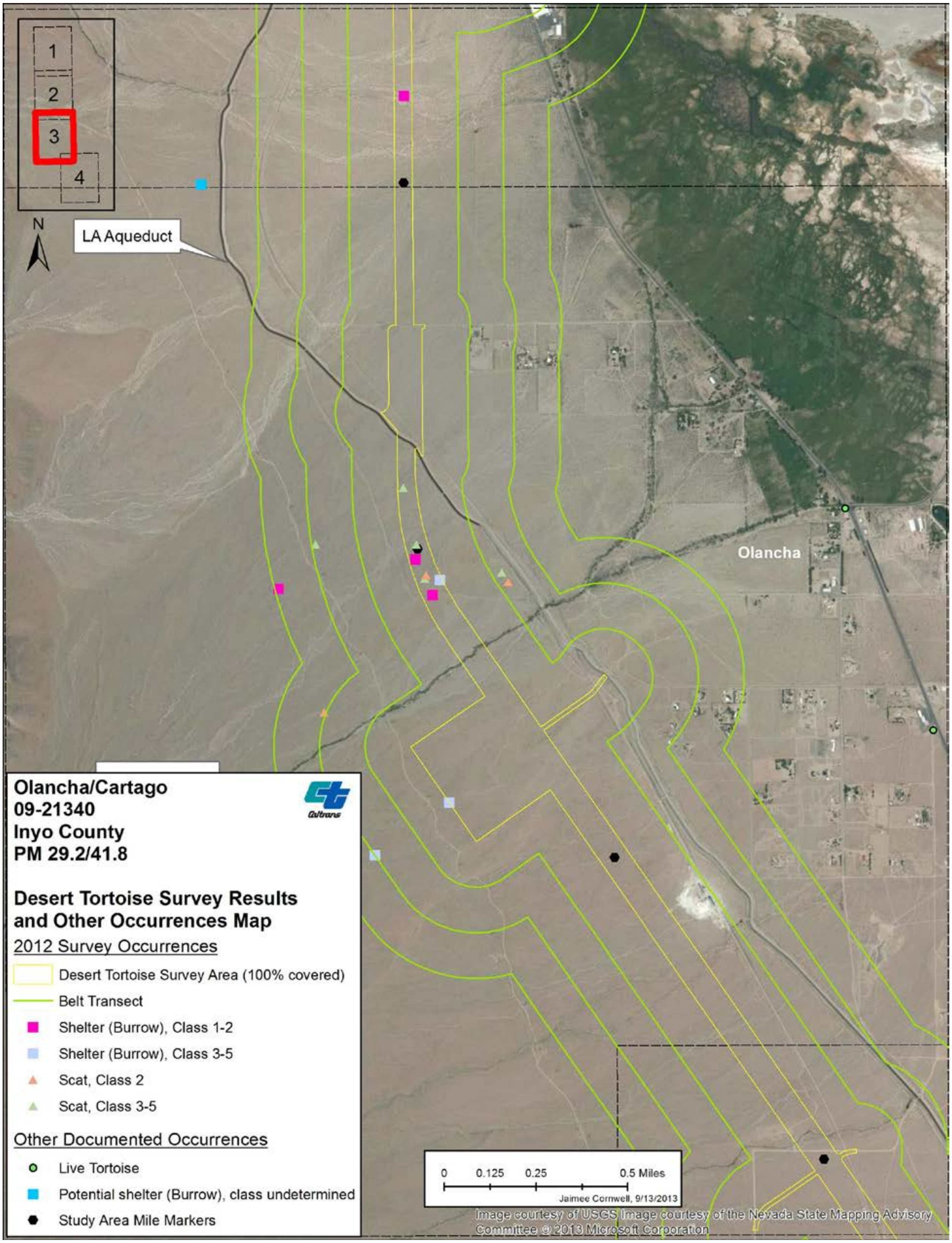
Desert Tortoise Survey Results
and Other Occurrences Map
2012 Survey Occurrences
Desert Tortoise Survey Area (100% covered)
Belt Transect
Shelter (Burrow), Class 1-2
Shelter (Burrow), Class 3-5
Scat, Class 2
Scat, Class 3-5
Other Documented Occurrences
Live Tortoise
Potential shelter (Burrow), class undetermined
Study Area Mile Markers
0 0.125 0.25 0.5 Miles
Jaimee Cornwell, 9/13/2013
Image courtesy of USGS Image courtesy of the Nevada State Mapping Advisory Committee © 2013 Microsoft Corporation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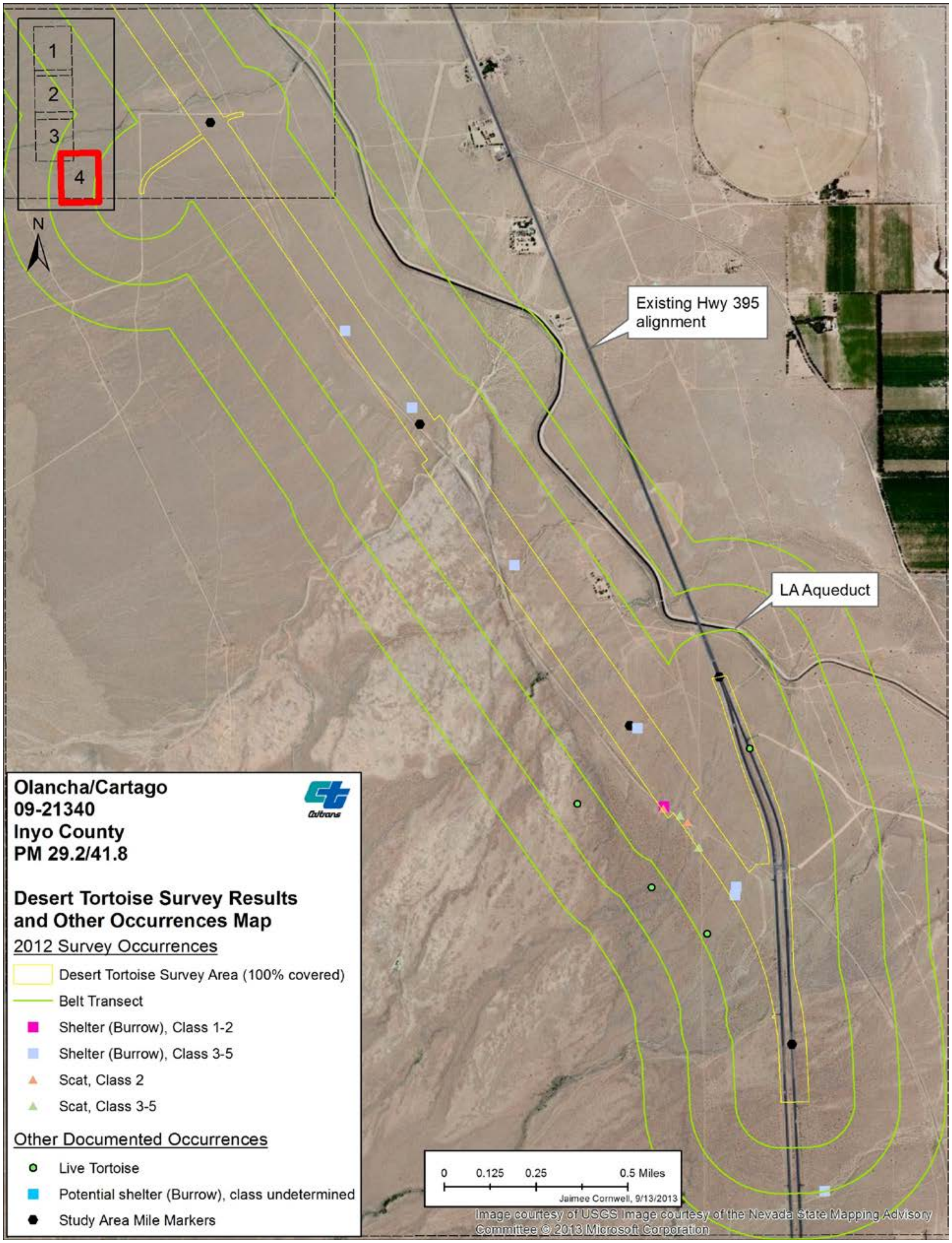
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Live Tortoise
Potential shelter (Burrow), class undetermined
Study Area Mile Markers
0 0.125 0.25 0.5 Miles
Jaimee Cornwell, 9/13/2013
Image courtesy of USGS Image courtesy of the Nevada State Mapping Advisory Committee © 2013 Microsoft Corporation

4.3.2.2. AVOIDANCE AND MINIMIZATION MEASURES

Although the project site is at the northern extent of the Mojave desert tortoise' range, habitat within and adjacent to the project site remains relatively undisturbed and has been shown to contain areas of suitable habitat for the species. Therefore, Caltrans is proposing the following permanent, on-site avoidance measures to protect desert tortoise' inhabiting areas within and adjacent to the project site during and after construction of the project:

1. Installation of permanent exclusionary desert tortoise fencing.

2. Installation of approximately thirteen tortoise undercrossings, to be appropriately sized and installed in locations where new culverts have been specified. Please refer to Figure 12 for the proposed locations of the undercrossings.

3. Tortoise friendly cattle guards, at access roads, to prevent tortoise access to the new alignment. The cattle guards will be modified to include cement tortoise escape ramps, so individuals do not become entrapped.

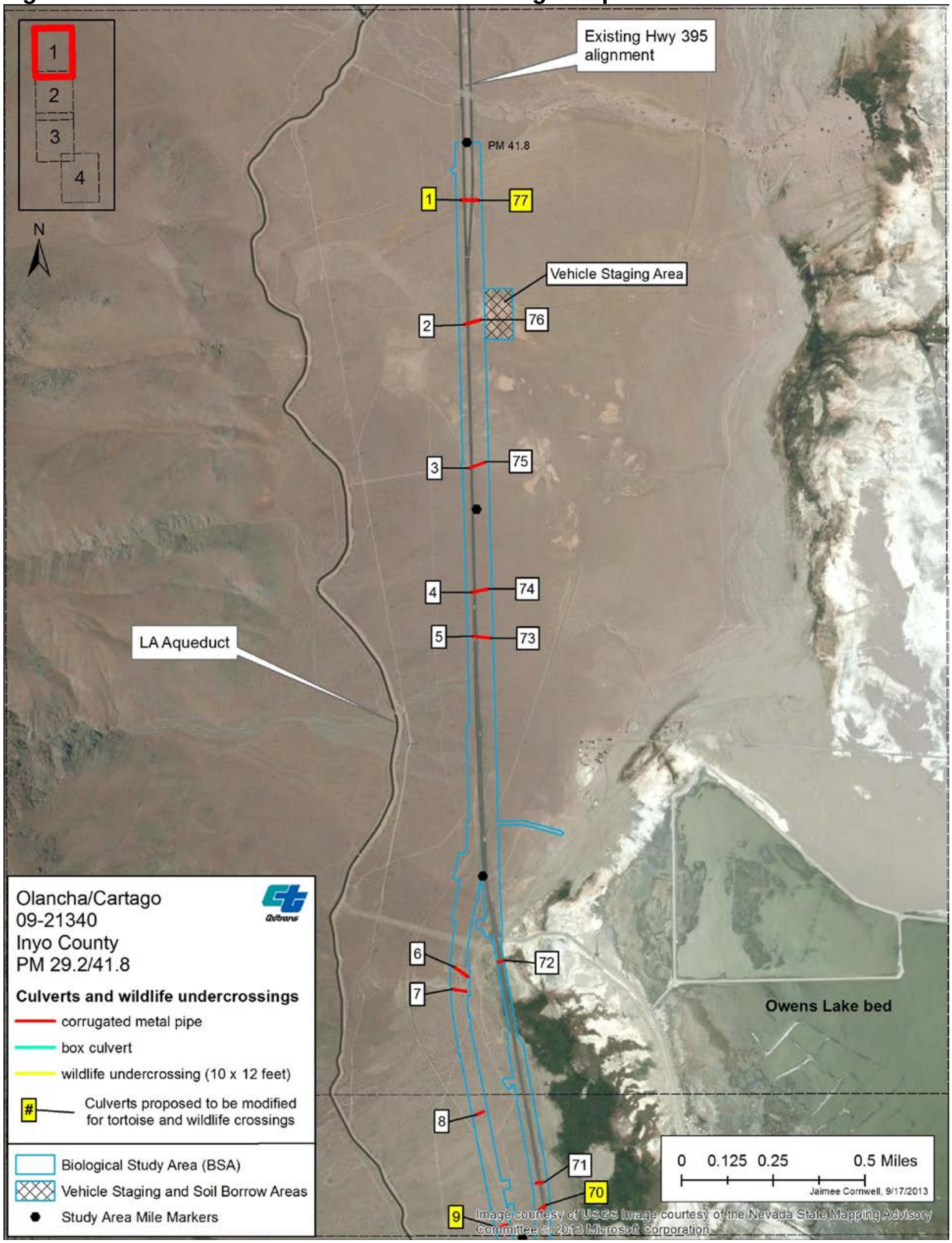
At this time, the specific details and locations of the proposed permanent tortoise fencing, undercrossings and modified cattle guards is still in process; therefore, the provided mapped locations for the undercrossings are preliminary and could change prior to being finalized. However, once the locations and design specifications have been confirmed, they will be provided to the USFWS and CDFW.

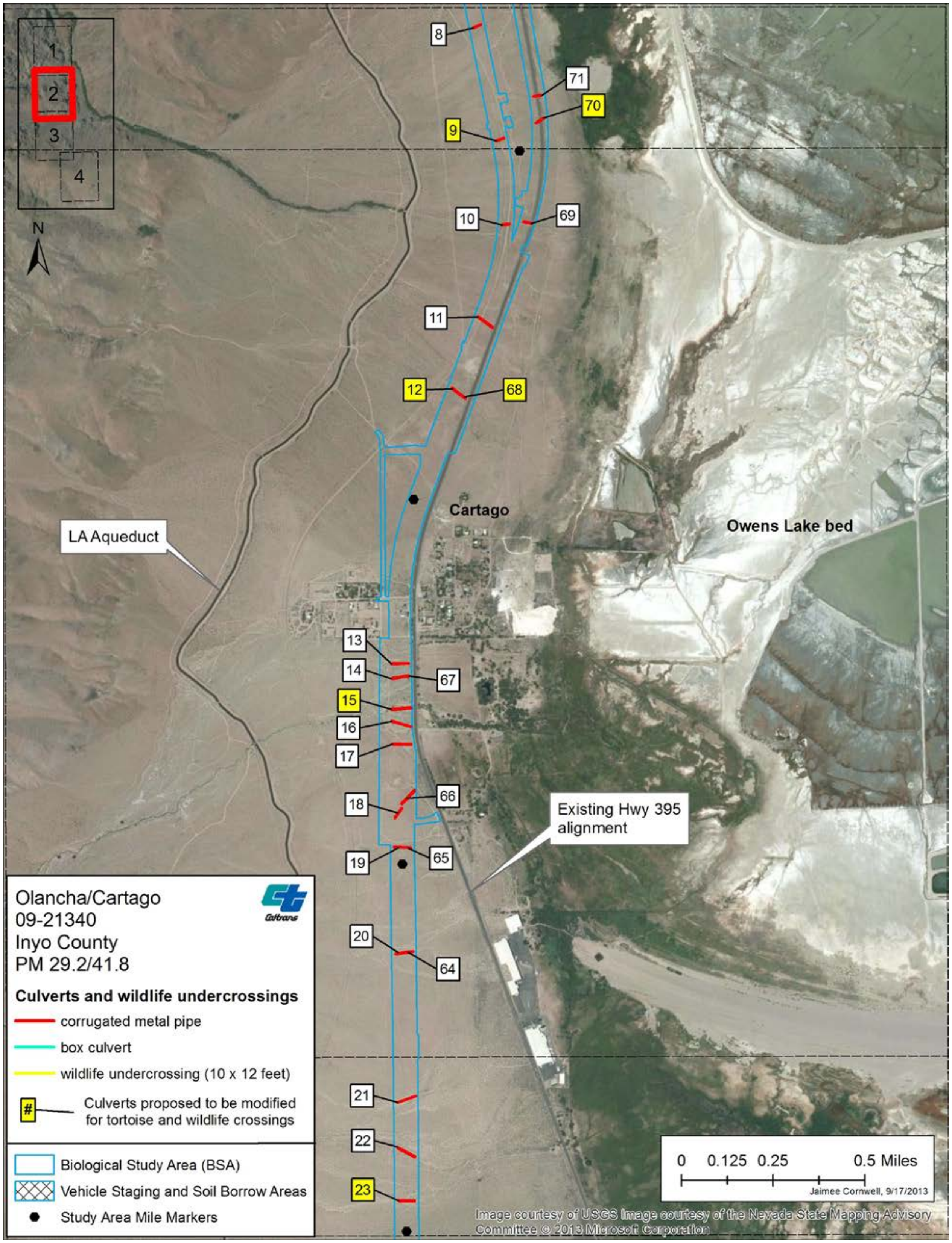
In addition to the permanent on-site avoidance measures described above, the following additional avoidance and minimization measures will be employed to protect the desert tortoise prior to and during construction:

4. Prior to construction, a USFWS-authorized biological monitor(s) will conduct focused clearance surveys for the desert tortoise. The surveys will follow the most recent USFWS desert tortoise survey protocol. The surveys will cover the entire RoW as well as adjacent undeveloped lands located between the existing and new alignment and between the new alignment and the Aqueduct as shown in Figure 13.

The USFWS-authorized biological monitor will be referred to as "the monitor" hereafter.

Figure 12: Culverts and Wildlife Undercrossings Map

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PM 29.2/41.8
Culverts and wildlife undercrossings
corrugated metal pipe
box culvert
wildlife undercrossing (10 x 12 feet)
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Culverts proposed to be modified for tortoise and wildlife crossings
Biological Study Area (BSA)
Vehicle Staging and Soil Borrow Areas
Study Area Mile Markers
0 0.125 0.25 0.5 Miles
Jaimee Cornwell, 9/17/2013
Image courtesy of USGS Image courtesy of the Nevada State Mapping Advisory Committee © 2013 Microsoft Corporation

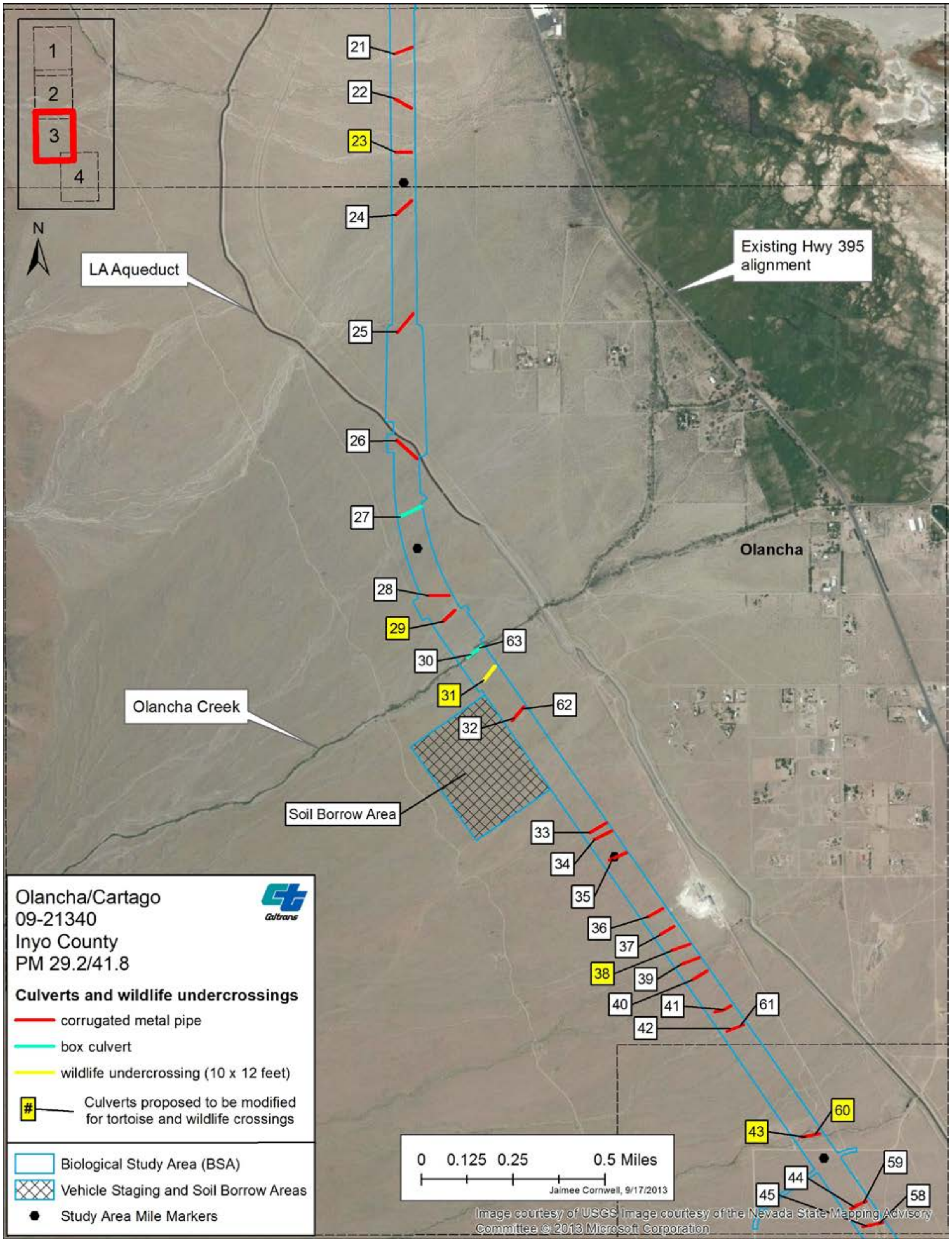
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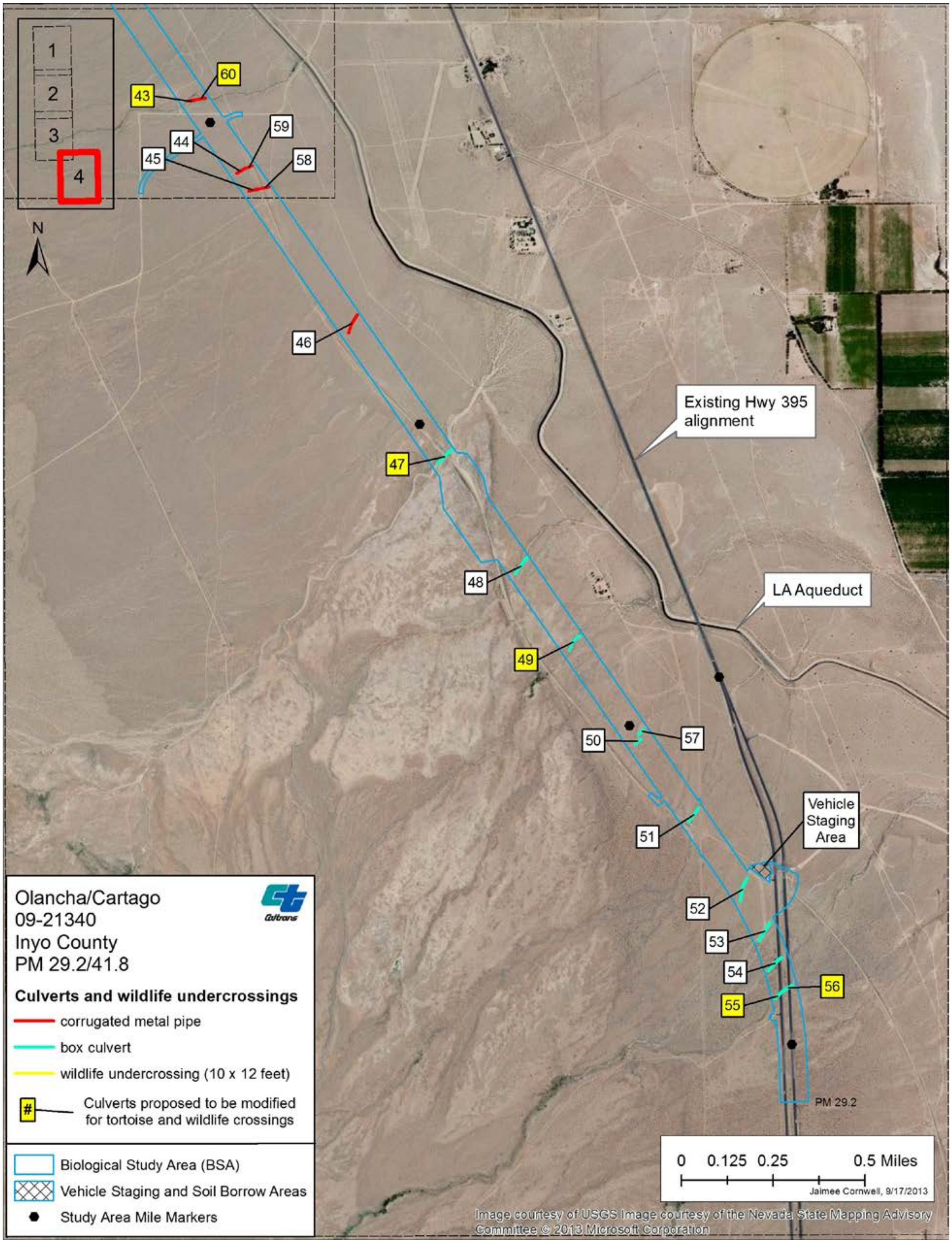
Image courtesy of USGS Image courtesy of the Nevada State Mapping Advisory Committee © 2013 Microsoft Corporation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Culverts and wildlife undercrossings
corrugated metal pipe
box culvert
wildlife undercrossing (10 x 12 feet)
Culverts proposed to be modified for tortoise and wildlife crossings
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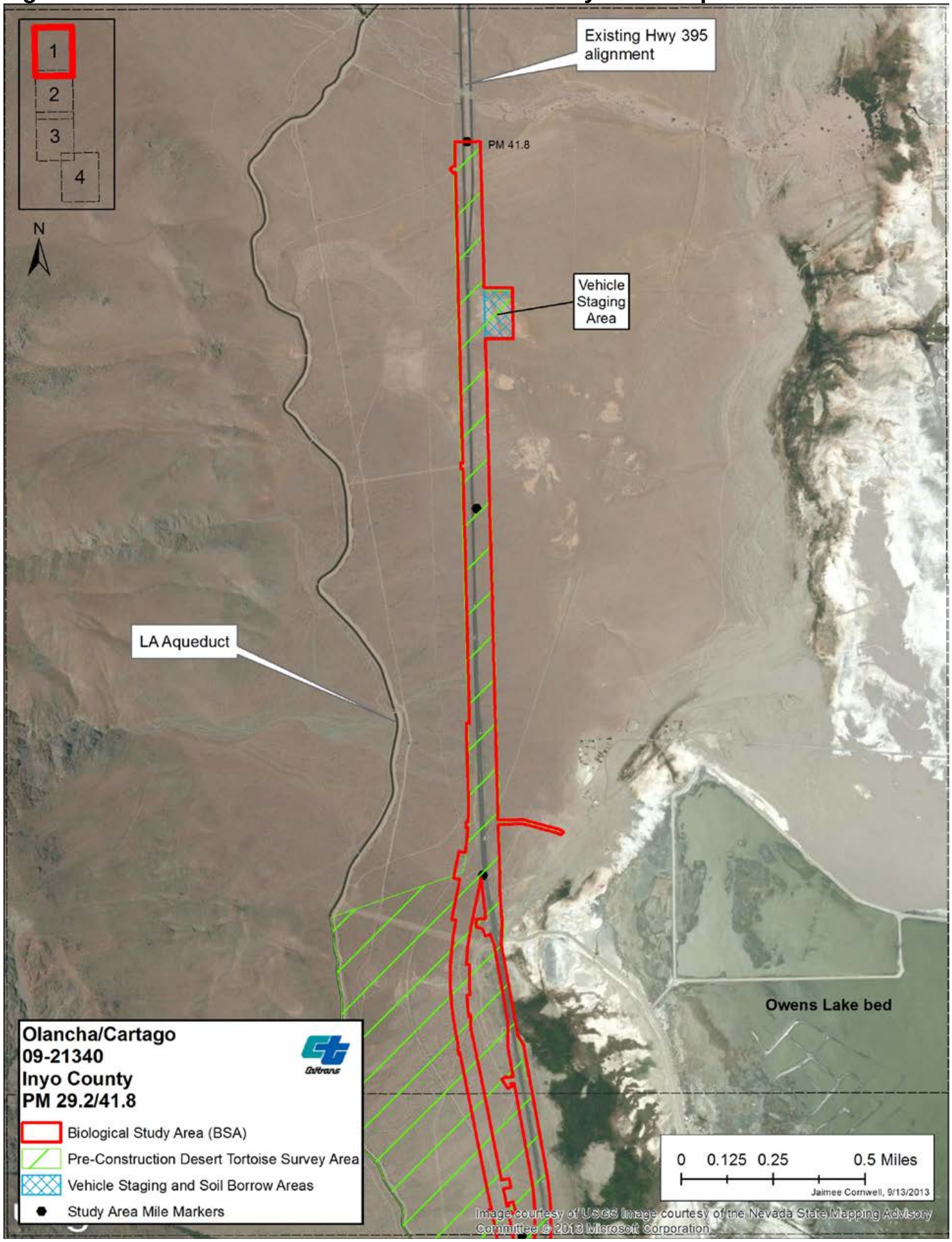
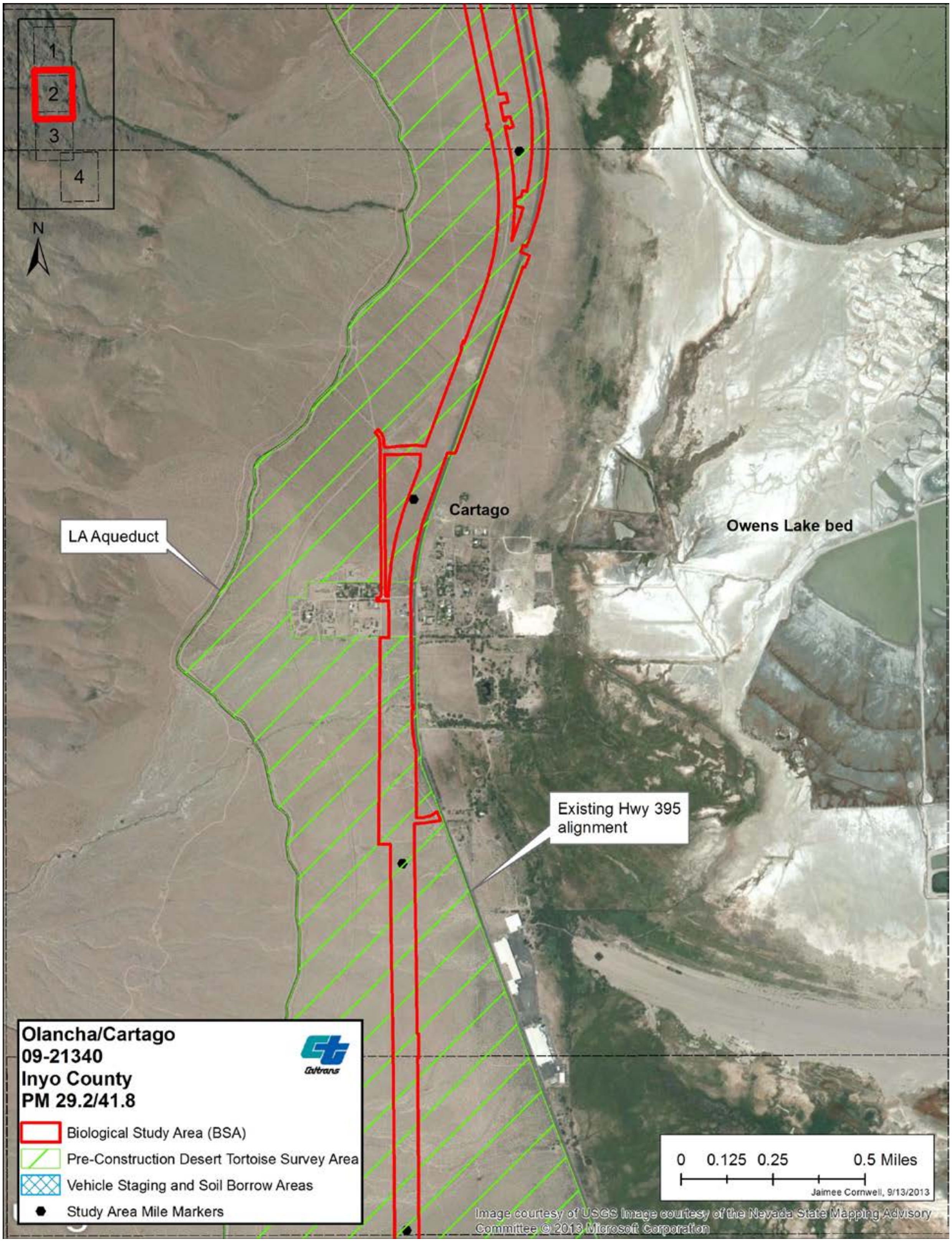
Vehicle Staging and Soil Borrow Areas
Study Area Mile Markers
0 0.125 0.25 0.5 Miles
Jaimee Cornwell, 9/17/2013
Image courtesy of USGS Image courtesy of the Nevada State Mapping Advisory Committee © 2013 Microsoft Corporation

Figure 13: Pre-construction Desert Tortoise Survey Area Map

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Jaimee Cornwell, 9/13/2013
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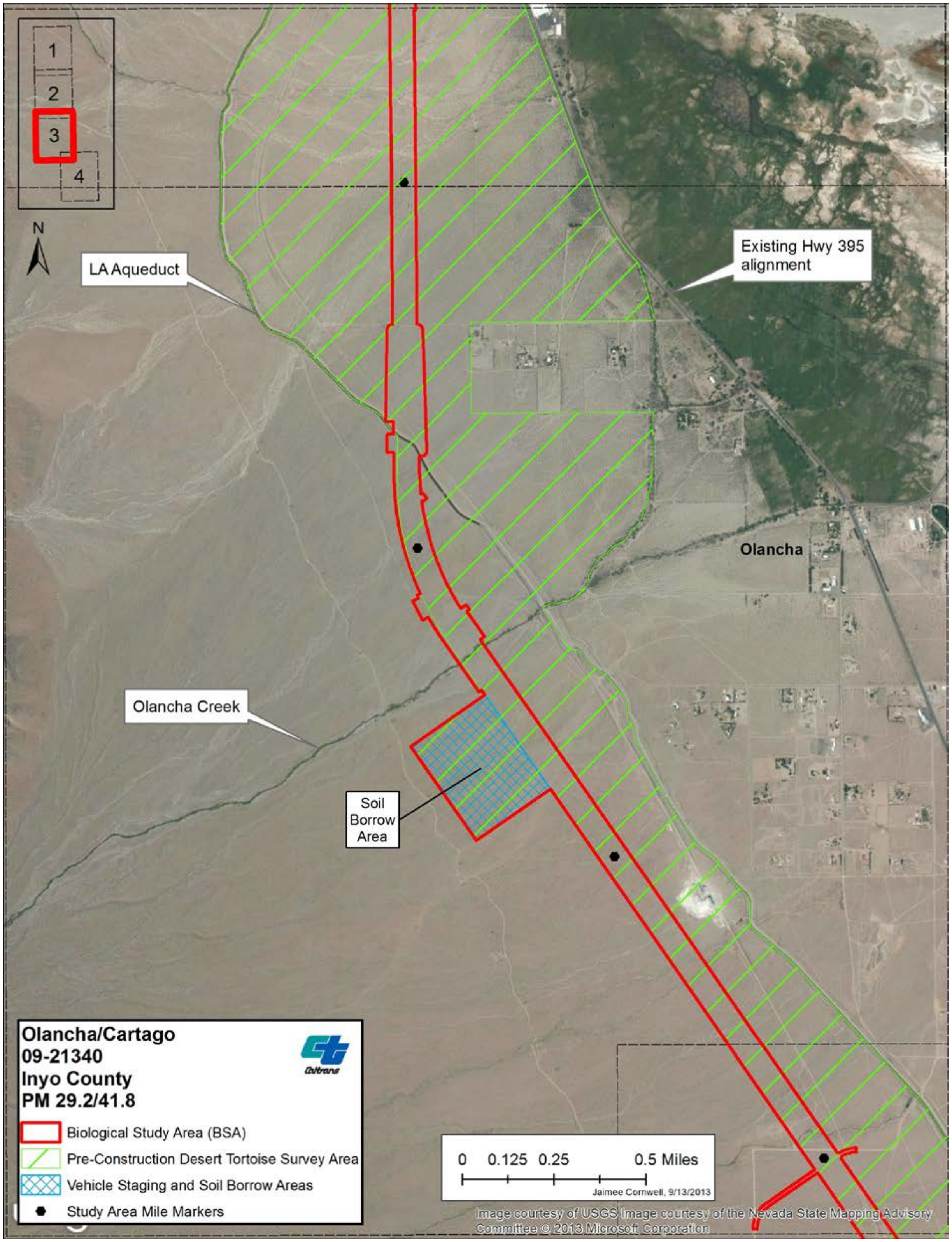
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Olancha Creek
Soil Borrow Area
Olancha/Cartago
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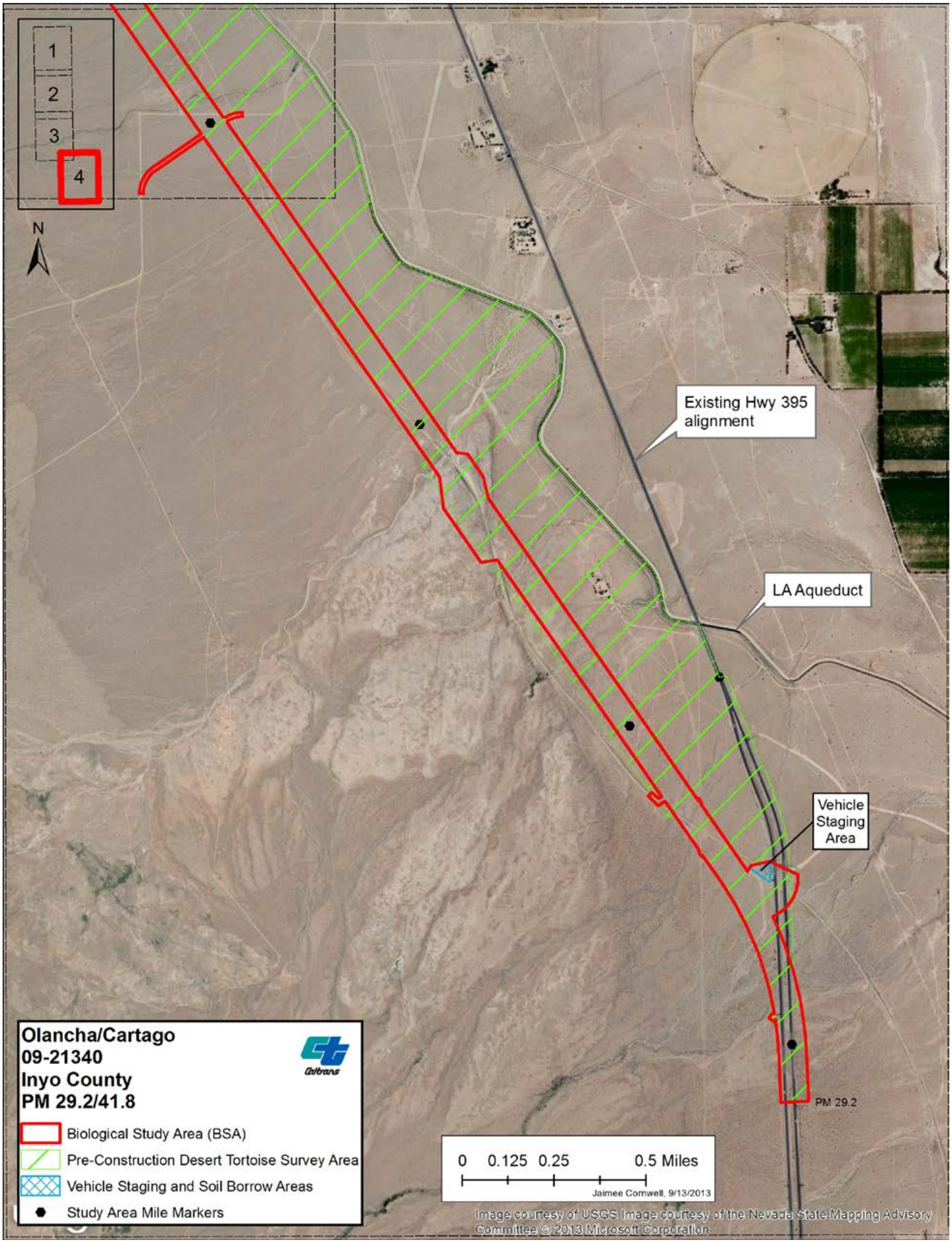
Inyo County
PM 29.2/41.8
Biological Study Area (BSA)
Pre-Construction Desert Tortoise Survey Area
Vehicle Staging and Soil Borrow Areas
Study Area Mile Markers
0 0.125 0.25 0.5 Miles
Jaimee Cornwell, 9/13/2013
Image courtesy of USGS Image courtesy of the Nevada State Mapping Advisory Committee © 2013 Microsoft Corporation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0 0.125 0.25 0.5 Miles
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5. The monitor(s) will determine if any tortoise’ are present on or in the vicinity of the project site, and if any tortoise’ need to be relocated, and/or any burrows collapsed, to prevent isolating individuals from the rest of the population. Upon discovery of a tortoise or active tortoise burrow, the following avoidance measures will be implemented:

    a. An on-call USFWS-authorized desert tortoise biologist will be contacted to collapse any recent (Class 1 or 2) tortoise’ burrows and/or to relocate any live tortoise’ found in the PIA, new RoW, or areas located between the existing and new alignments where the potential exists for individuals to become isolated from the rest of the remaining population.

The USFWS-authorized desert tortoise biologist will be referred to as “the biologist” hereafter.

    b. In some cases, the biologist may choose to contact the USFWS to determine if the collapsing of a particular burrow and/or the relocation of an individual is appropriate, based on its’ proximity to the new alignment. If it is deemed unnecessary to collapse a burrow, the USFWS will be notified and a GPS point will be taken at the burrow, to record its’ location. In addition, the monitors will establish a demarcated Environmentally Sensitive Area (ESA) around the burrow to provide a buffer from construction activities in its proximity. At the on-set of construction, activities in proximity to an ESA-fenced burrow would be monitored by the monitor, who would be present until construction has been completed in the area, or until the monitor, in consultation with the USFWS, deems that monitoring is no longer needed in that location.

6. Prior to the onset of <u>any</u> ground disturbing activities associated with the project, the monitor shall provide all construction personnel who will be present on the work site (within or adjacent to the RoW) with a mandatory worker education training which will include the following information:

    a. A detailed description of the desert tortoise and their life history, including color photographs of the species as well as their scat and burrows;

   b. A description of the protection the desert tortoise receives under the Federal and State Endangered Species Acts and possible legal action that may be incurred for violation of the Acts, including discussion of the definition of "take";

   c. A list of the protective measures being implemented on-site to conserve the desert tortoise which will include the following:

      i. "Look Before You Move"- all employees and contractors at the project shall look under vehicles and equipment for the presence of desert tortoise before moving the vehicle or equipment. If a desert tortoise is observed, no vehicles or equipment would be moved until the animal has left voluntarily or is removed by the on-call biologist;

      ii. An emphasis of the "Do Not Touch" policy that applies to all workers on the project;

      iii. All trash that may attract predators of desert tortoise (mainly ravens) will be removed from work sites, or completely secured at the end of the day;

      iv. All workers will be advised that equipment and vehicles must remain within the designated work areas, to be provided and approved by the monitor prior to the on-set of construction.

   d. A point of contact in case a desert tortoise is observed and the monitor is not in the immediate vicinity of the observation.

7. The first order of construction would be to install permanent desert tortoise exclusionary fencing. The fencing will be installed in areas that have been surveyed and cleared by the monitor.

8. The monitor will be on-site daily to monitor any new project associated ground-disturbing activities occurring in areas where the ground was previously undisturbed. If no live desert tortoise are observed once the ground disturbing activities are completed, the monitor will be present on the project site at least one working day within a two-week period to monitor the on-going construction activities until the completion of construction.

9. A Caltrans construction inspector (CI) will be present on the project site, throughout the duration of construction. He or she, in consultation with the monitor, shall have the authority to stop any and/or all activities that might result in the "take" of a tortoise.

10. If at any time during construction a desert tortoise is found in an area that has been fenced to exclude the species, activities will cease until the RE, in consultation with the monitor, has indicated that work may resume.

11. If a desert tortoise is found adjacent to the permanently fenced construction area, work in the area will cease until the monitor is present, or until the monitor in consultation with USFWS, has determined whether additional avoidance or minimization measures are needed prior to continuing construction in the area.

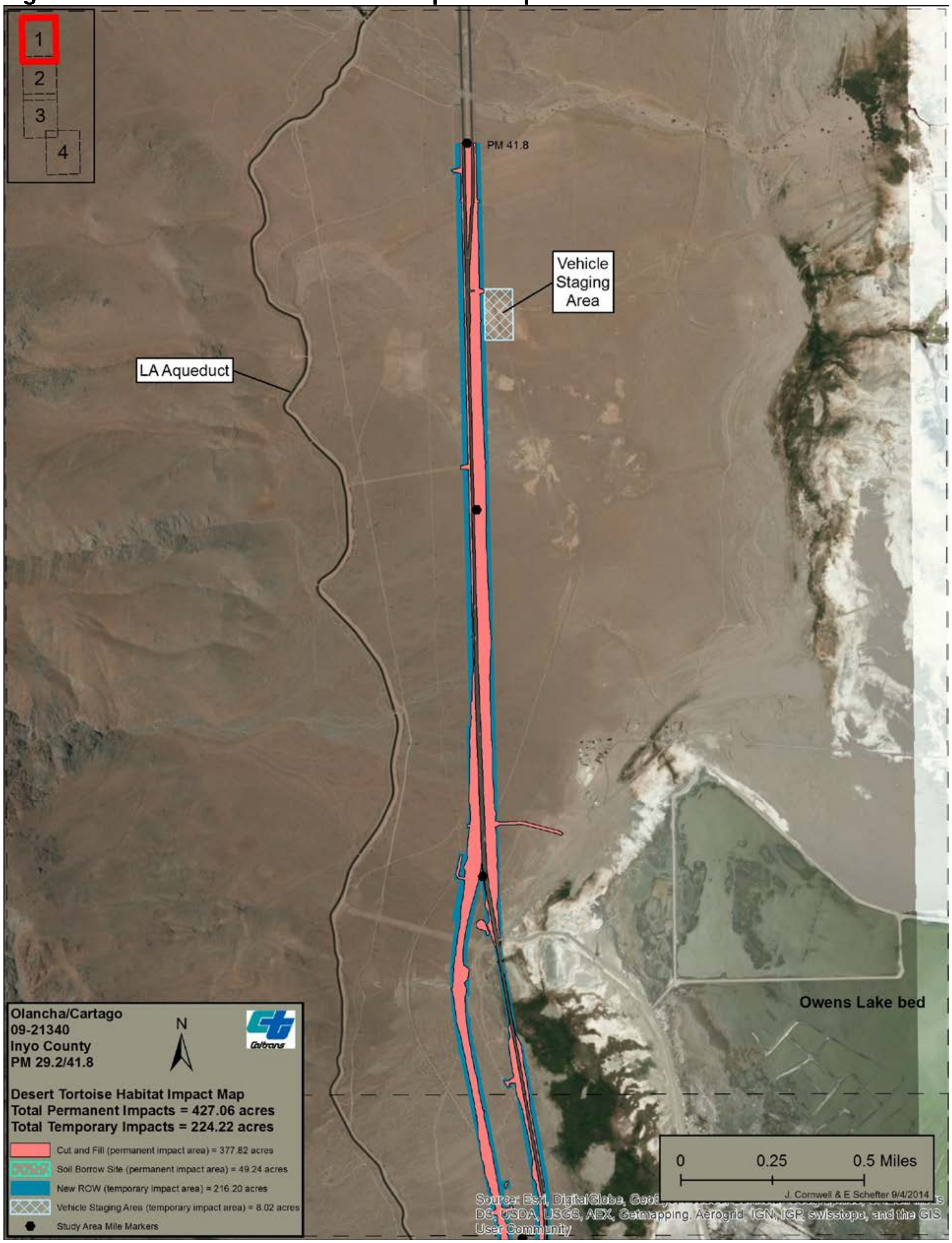
4.3.2.3. PROJECT IMPACTS

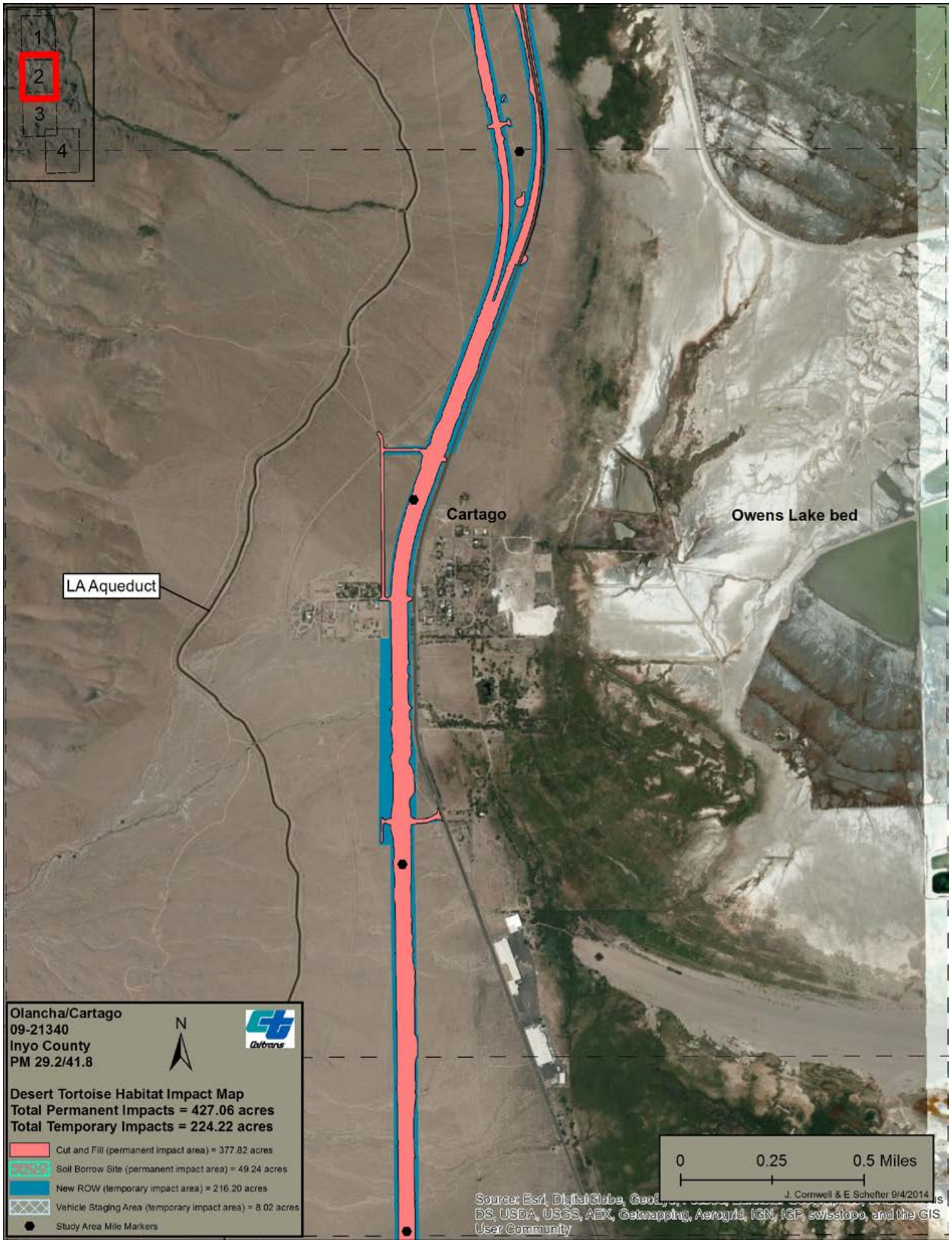
Approximately 427.06 acres of potentially suitable habitat for the desert tortoise will be permanently impacted as a result of the proposed project and an additional 224.22 acres of potentially suitable habitat may be temporarily impacted during project construction (Figure 14). Due to the installation of the permanent desert tortoise exclusionary fencing, wildlife undercrossings and tortoise-friendly cattle guards, as well as the plan to relocate individuals (that may become isolated once construction has been completed) during the pre-construction surveys, Caltrans does not anticipate any indirect effect to this species. Therefore, a total of 651.28 acres of potential desert tortoise habitat will be directly impacted by the proposed project.

4.3.2.4. COMPENSATORY MITIGATION

The project site is not located within designated desert tortoise Critical Habitat; therefore, impacted lands will be compensated for at a lower ratio, as approved by the CDFW and USFWS. A total of 427.06 acres of permanent and 224.22 acres of temporary impacts to potentially suitable desert tortoise habitat will be compensated for through either the purchase of mitigation bank credits, or suitable desert tortoise habitat to be preserved in perpetuity, as approved by the USFWS and CDFW.

Figure 14: Desert Tortoise Habitat Impact Map

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Inyo County
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Desert Tortoise Habitat Impact Map
Total Permanent Impacts = 427.06 acres
Total Temporary Impacts = 224.22 acres
Cut and Fill (permanent impact area) = 377.82 acres
Soil Borrow Site (permanent impact area) = 49.24 acres
New ROW (temporary impact area) = 216.20 acres
Vehicle Staging Area (temporary impact area) = 8.02 acres
Study Area Mile Markers
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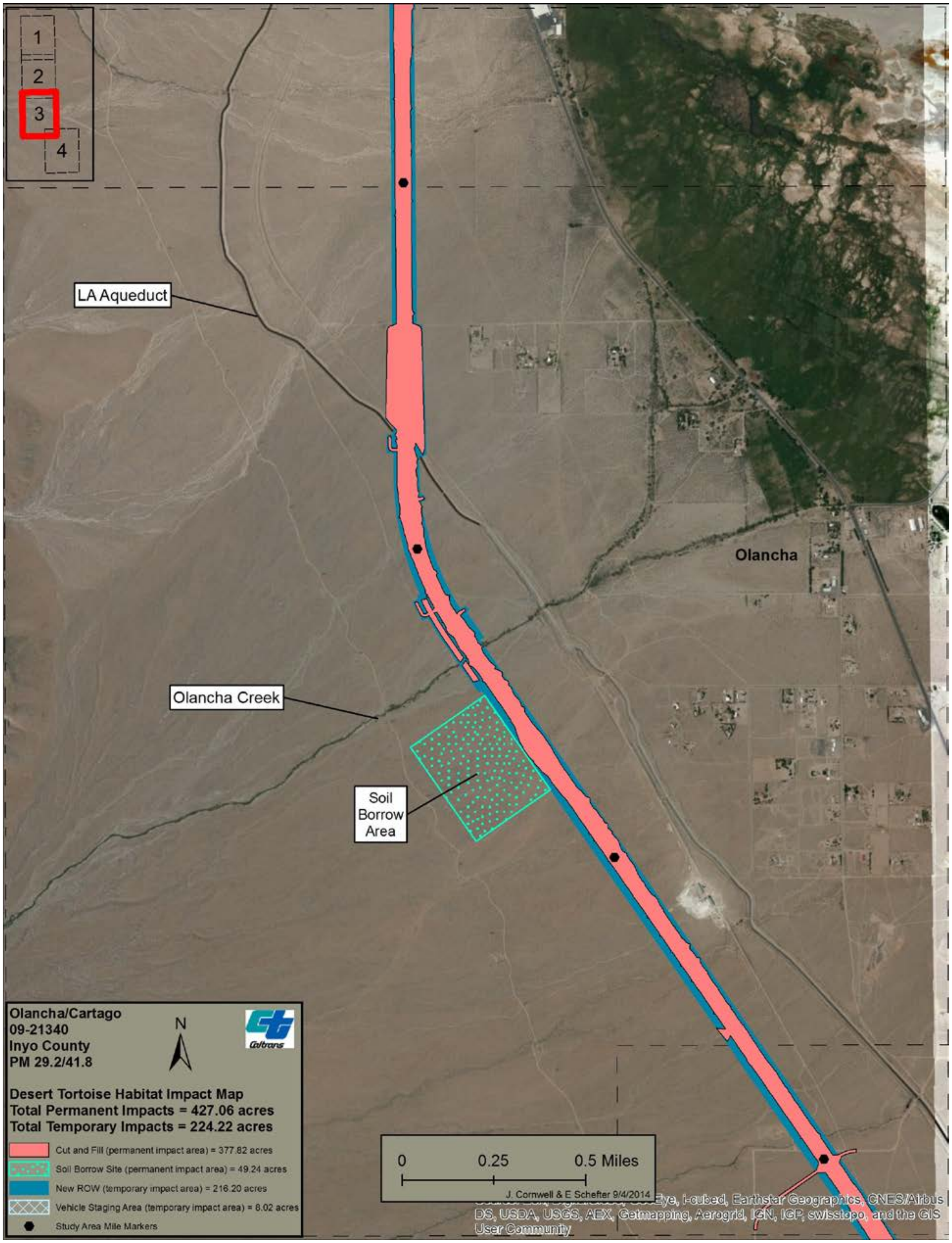
J. Cornwell & E Schefter 9/4/2014
DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS
User Community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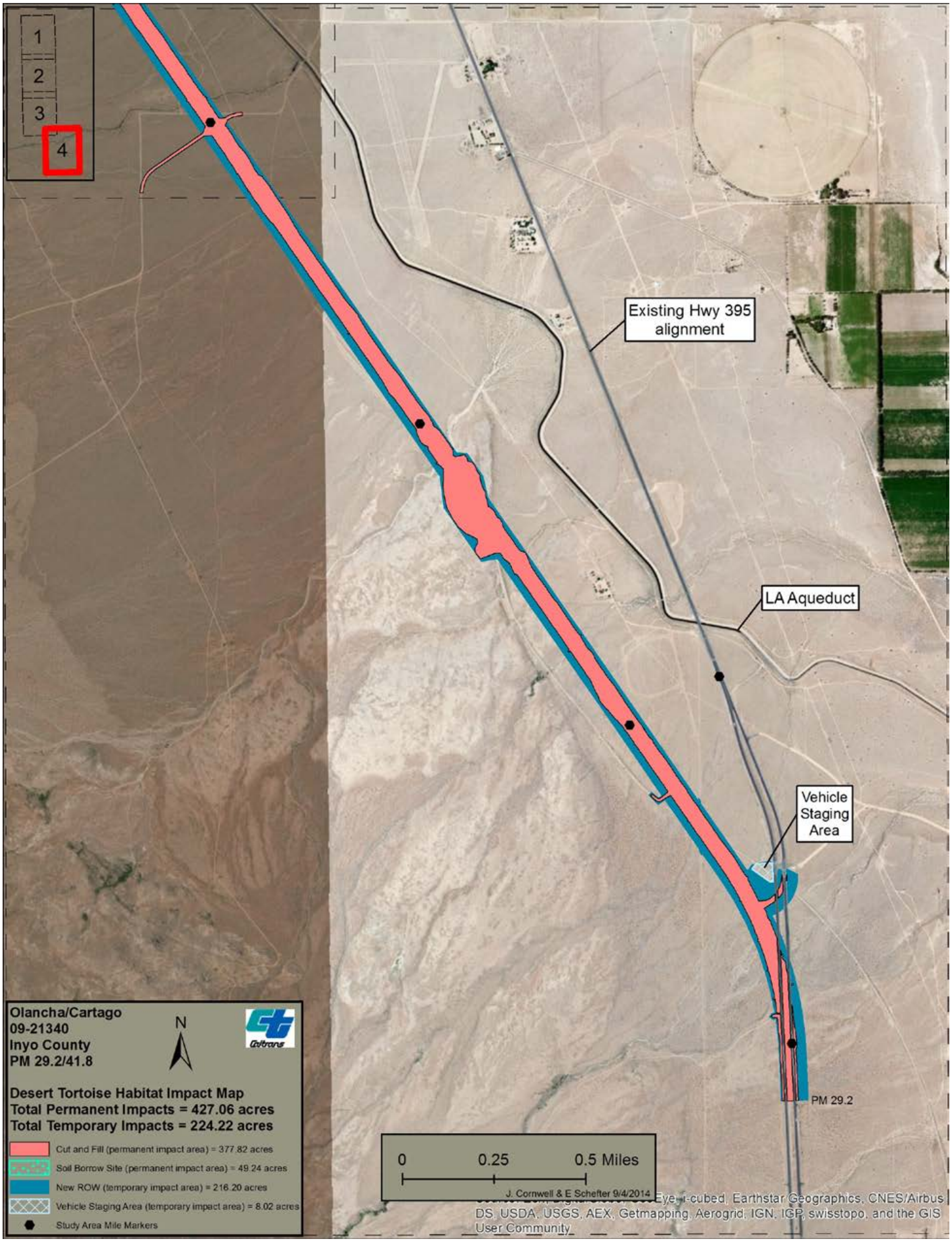
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Eye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

4.3.3. Discussion of the Golden Eagle

The golden eagle (*Aquila chrysaetos*) is a state-fully protected species that is also offered protection under the following three federal laws: The Bald and Golden Eagle Protection Act, The Migratory Bird Treaty Act and The Lacey Act (USFWS 2011). The golden eagle is also identified as a BLM-sensitive species. Based on best available survey data, the USFWS estimates this species numbers may be approximately 30,000 individuals across the Unites States. Golden eagles live in semi-open habitats across the majority of the northern hemisphere. They prefer canyonlands, mountain habitats, riverside cliffs and bluffs; nesting on cliffs or the largest tree in a forested area to obtain unobstructed views of their surrounding landscape. This species typically avoids nesting in urban areas, due to their sensitivity to human disturbance, but have been observed nesting in rural urban areas and farmlands.

The greatest threats to the golden eagle are human-induced impacts. The majority of documented deaths for this species result from vehicle collisions, wind turbines, and impacts from other human-developed structures, such as electrocution from power poles. Other human caused impacts to this species include: urbanization and agricultural developments and changes in wildfire regimes, all of which have compromised habitats used for nesting and hunting (Cornell Laboratory of Ornithology 2013).

4.3.3.1. Survey Results

Three documented golden eagle nest sites are located less than ten miles from the project site. The first nest site, documented during aerial surveys conducted in 1977, is located approximately 7 ½ miles southeast of the southern end of the project (CNDDB 2014). The second documented nest site was observed in 2009 and is located just over 7 ½ miles south of the southern end of the project site (CNDDB 2014). The third nest site, also located during the 1977 aerial surveys, is east of the Owens Lake bed and approximately 6 ¾ miles east of the project site (CNDDB 2014).

Although no golden eagles were observed on the project site during the focused raptor surveys conducted in 2001, they were observed flying high above the project site during other field surveys completed in 2001. Because there are no cliffs or large trees in the project site, there is no suitable nesting habitat; however, nesting golden eagles in the vicinity may use the project site and/or lands in the larger vicinity for foraging.

4.3.3.2. AVOIDANCE AND MINIMIZATION MEASURES

Although no nests or specific foraging behaviors have been observed on the project site, avoidance and minimization measures are being proposed to avoid take of this species. All tree and vegetation removal will be completed from approximately September to February, which is outside the nesting season, unless deemed unfeasible and subsequently pre-authorized by the project biologist. Pre-construction migratory bird clearance surveys will be completed both prior to any clearing or grubbing and prior to the start of construction, if these activities do not occur concurrently. If any golden eagles attempt to build a nest on the project site between now and the start of construction, a protective ESA and construction buffer will be established around the nest prior to any clearing and grubbing. A qualified project biologist will be present to monitor the nest during all construction activities in the vicinity of the nest and the ESA will be maintained until the young have fledged.

In addition, an environmental Worker Education Training (WEAP) will be provided to all workers who enter the project site, to discuss the golden eagle. In addition to providing a description of the protection the golden eagle receives, the WEAP will also inform workers that if any eagles are observed on the site, construction activities will be halted until the individual leaves the site on its own accord.

Furthermore, because a project biologist will be present at the project site at least once per week throughout the duration of construction, golden eagles will be watched for, even if no birds are observed on the project site between now and the start of construction.

4.3.3.3. COMPENSATORY MITIGATION

No compensatory mitigation is being specifically proposed for the golden eagle; however, the off-site land that will be purchased to mitigate for the 651.28 acres of impacts to desert tortoise habitat is expected to also provide foraging habitat for the golden eagle.

4.3.4. Discussion of the Burrowing Owl

The Burrowing owl (*Athene cunicularia*) is designated a California Species of Concern by the CDFW and is listed as sensitive by the BLM. Burrowing owls are widely distributed throughout western North America, and Florida. Burrowing owls in Florida and the southern portion of their western range, including the majority of California, are year-round residents (Shuford and Gardali 2008). In California, this species habitat preference includes grasslands, deserts and shrub steppe communities that are open with few shrubs and/or sparse vegetation, gentle topography and well-drained soils (Haug et al. 1993, CDFW 2012). Burrowing owls have also been shown to use somewhat disturbed habitats such as agricultural fields, ruderal grassy fields, vacant lots and pastures as long as their preferred habitat conditions are present and appropriate burrows and foraging habitat is in close proximity (Gervais et al. 2008). This species primarily relies upon burrows constructed by ground squirrels (*Spermophilus* sp.), but also uses burrows excavated by badger, coyote, and fox. Burrowing owls have also been shown to sometimes excavate their own burrows as well as use man-made structures such as artificial burrows, culverts and debris piles.

Although burrowing owl populations within the state of California have increased in number in some portions of the state (Imperial Valley) due to agricultural expansion, their numbers have decreased throughout much of their historical range, due to habitat loss from urban development (along the coast and in the Central Valley) (CDFW 2008). This species relies upon suitable foraging habitat throughout the year and most importantly during the breeding season, which is generally between February 1st and August 1st (CDFW 2012 and 2008). Other factors contributing to this species decline are: rodent control efforts, which remove ground squirrel burrows that would be otherwise available for burrowing owls; vehicle mortality; and the use of pesticides, which needs further study (CDFW 2012).

4.3.4.1. Survey Results

No burrowing owls, or their sign, were detected during the focused raptor surveys conducted in 2001. However, during the 2012 focused desert tortoise surveys, three burrowing owls were observed south of Olancha Creek in the southern portion of project site (ECORP 2012). Two of the documented observations were just east of the soil borrow site (one located along its eastern boundary and the other located approximately 1/16th of a mile east of the eastern boundary), both of these locations are within the proposed alignment. The third observation was of an owl at its burrow, located on the western edge of the proposed alignment, approximately 1⅓rd of a mile south of the southern boundary of the soil borrow site.

In 2013, pre-geotechnical bore clearance surveys were conducted by Caltrans biologists within the proposed soil borrow site. These surveys followed the survey protocol guidelines outlined in the *Burrowing Owl Survey Protocol and Mitigation Guidelines*; however, no burrowing owls or their sign (burrows or burrows with scat) were observed, even upon a close and thorough inspection of the two observation sites located east of the soil borrow site (The California Burrowing Owl Consortium 1993).

4.3.4.2. AVOIDANCE AND MINIMIZATION MEASURES

Because burrowing owls were observed within the project site during the 2012 desert tortoise surveys, the following avoidance and minimization measures will be employed to protect this species both during and after construction:

1. Prior to construction, protocol level surveys will be conducted to determine the potential presence of individual burrowing owls as well as the location of any of their burrows within the project site. The surveys will follow the guidelines described in the most recent burrowing owl survey protocol. These surveys will cover the entire RoW as well as adjacent undeveloped lands located approximately 500 feet beyond the new RoW to address indirect impacts to this species that will result from the constructed project.

The surveys will be used to determine the following:

a. If any burrowing owls or active burrows are present in or in the immediate vicinity of the RoW;
b. If any individual owls need to be trapped and relocated;
c. If any active burrows need to be collapsed to prevent owls from returning to the project site and possibly becoming disturbed by the construction activities or by the introduction of vehicles to the area as a result of the constructed project;
d. If any active burrows contain owlets (during the nesting season, approximately April 15th to July 15th) that would need to be protected with an established ESA and appropriate construction buffer that would be in place until the owlets fledge.

If it is determined that a burrowing owl needs to be relocated or that an active burrow needs to be collapsed to prevent owls from re-entering the project site, the following avoidance measures will be implemented:

i) A biologist will collapse any active burrows and trap and relocate any live burrowing owls found in the survey area (areas in the new RoW and areas of indirect impact, located approximately 500 feet beyond the new RoW);

ii) Construction activities in proximity to an ESA-fenced burrow will be monitored on a weekly basis by a project biologist;

Weekly monitoring will be continued until:

(a) The owlets have fledged, or

(b) Construction has been completed in the area, or

(c) The biologist, in consultation with the CDFW, determines that monitoring is no longer needed in that location.

2. Prior to the onset of any ground disturbing activities associated with the project, the monitor shall provide all construction personnel who will be present on the work site (within or adjacent to the RoW) with a mandatory worker education training which will include the following information:

   a. A detailed description of the burrowing owl and their life history, including color photographs of the species as well as their scat and burrows;

   b. A description of the protection the burrowing owl receives from the CDFW and possible legal action that may be incurred for violation of the protection this species receives;

   c. All trash that may attract predators of burrowing owls will be removed from work sites, or completely secured at the end of the day;

   d. All workers will be advised that equipment and vehicles must remain within the designated work areas, to be provided and approved by the monitor prior to the on-set of construction.

4.3.4.3. PROJECT IMPACTS

Approximately 651.28 acres of impacts to potential burrowing owl habitat will result from the constructed project.

4.3.4.4. COMPENSATORY MITIGATION

Although no compensatory mitigation is being proposed for direct impacts to burrowing owl habitat, the mitigation for the desert tortoise will concurrently provide habitat for the burrowing owl.

4.3.5. Discussion of the Swainson’s Hawk

The Swainson’s hawk (*Buteo swainsoni*) is a CDFW state-threatened species and is listed as sensitive by the BLM. Swainson’s hawks breed or migrate in California within the Central and Owen’s Valleys and Mojave Desert. Swainson’s hawks breed and nest in areas with few trees in juniper-sage flats, riparian areas and oak savannah habitats, or other sparsely-treed areas located adjacent to agricultural fields and pastures. They forage over open grasslands, shrub lands, alfalfa fields and pastures (CDFW 2006).

The most common threat to the Swainson's hawk is the loss of breeding and foraging habitat due to development (CDFW 2013). This species population numbers have also declined due to poisoning (from pesticide use), electrocution, infrastructure placement and climate change (CDFW 2013).

4.3.5.1. SURVEY RESULTS

No Swainson's hawks were observed during the focused surveys completed in 2001, or during any of the other field surveys completed for the proposed project. Although stick nests were discovered, no Swainson's hawks have been seen.

The NES, dated June 2003, contains correspondence with R. Schlorff of CDFW (May 17, 2001), who relayed that Karyn Sernka, who conducted surveys for Swainson's hawks in the area for several years, reported seeing no Swainson's hawks in May, 2001 in a historically occupied territory located at the southeastern portion of the project study area, off of Cactus Flat Road. She indicated that the last time that territory was occupied was in 1999 when the nest failed. This may be the same nest that was reported by Bagley and Leatherman in 1999. Furthermore, in a draft report, Ms. Sernka presented the results of a 1998 Swainson's hawk survey conducted in the Owens Valley, in which no Swainson's hawk nests were found south of Big Pine, approximately 40 miles north of the project site (no date).

On July 29, 2002, in an email from Ms. Sernka to T. Kucera, who conducted the Swainson's hawk surveys in 2001, Ms. Sernka reported that in the spring of 2002 there was a nesting pair of Swainson's hawks in one of the windbreak trees on the west side of an alfalfa field, off of Cactus Flat Road.

4.3.5.2. AVOIDANCE AND MINIMIZATION MEASURES

The proposed 4-3 Hybrid has been designed to avoid the unnecessary removal of trees as much as possible; however some tree removal is unavoidable. Tree and vegetation removal will be completed outside of (approximately September to February) the nesting season, unless deemed unfeasible and subsequently pre-authorized by the project biologist. The pre-construction migratory bird clearance surveys will be conducted both prior to any clearing and grubbing and prior to the start of construction if these activities do not occur concurrently. If any nesting Swainson's hawks are discovered within the project site, an ESA and construction buffer will be established around the nest until young have fledged and a qualified project biologist will be present to monitor the nest during construction activities in the vicinity.

4.3.5.3. PROJECT IMPACTS

Because Swainson's hawks are not expected to occur within the project site, no impacts to this species are anticipated.

4.3.5.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed.

4.3.6. Discussion of the Mountain Plover

The mountain plover (*Charadrius montanus*) is designated a California Species of Concern by the CDFW and is listed as sensitive according to the BLM. The mountain plover is California winter resident that occupies short-grass prairies, open sagebrush habitat and plowed fields in the Central Valley, foothills west of the San Joaquin Valley, Imperial Valley, Los Angeles, western portions of San Bernadino County, and along the Central Colorado River Valley (CDFW 2005, 2008). This species has also been documented outside of its known range along the northern coast of California as well as around Owens Lake in Inyo County (Huntington and Edson 2008, CNDDB 2013).

The mountain plover is a winter visitor in California between September and mid-March, with peak numbers from December through February (Garrett and Dunn 1981, Knopf and Rupert 1995, Knopf 1996). Knopf estimated the wintering population of mountain plovers in California to be approximately 4,000 to 7,000 birds, or approximately 50% to 88% of the world's entire population (1996). The major cause of this species decline is habitat loss and degradation on their wintering and breeding grounds (Knopf 1996, USFWS 2003). Specific causes leading to the degradation of their breeding habitat is the conversion of native grasslands to wheat production and other agricultural uses, detrimental range management practices, oil and gas developments, destruction of eggs and young from agricultural equipment and mortalities from adult collisions with agricultural and industrial vehicles (Knopf 1996, USFWS 2003). Loss and degradation of mountain plover wintering habitat is the conversion of grasslands and suitable agricultural lands to urban developed areas, vineyards and other incompatible land uses (Roberson 2002, USFWS 2003, Wunder and Knopf 2003).

4.3.6.1. SURVEY RESULTS

No surveys were conducted for the mountain plover and this species was not observed during any of the field work completed for this project. However; due to the documented occurrence of the mountain plover in the vicinity of Owen's Lake in 2007, it is possible this species could over-winter on lands within or adjacent to the project site (CNDDB 2013).

4.3.6.2. AVOIDANCE AND MINIMIZATION MEASURES

Pre-construction migratory bird clearance surveys will be completed on the project site prior to any ground-disturbing activities, such as clearing and grubbing, which will allow project biologists to determine the potential presence of any species of wildlife, including the mountain plover.

4.3.6.3. PROJECT IMPACTS

Because the mountain plover does not nest in the state of California, it is anticipated that if any mountain plovers are present on the project site prior to the onset of any ground disturbing activities, they will leave on their own accord. Therefore, no impacts to this species are anticipated.

4.3.6.4. COMPENSATORY MITIGATION

Because no impacts to this species are anticipated, no compensatory mitigation is proposed.

4.3.7. Discussion of the Southwestern Willow Flycatcher

The southwestern willow flycatcher (*Empidonax traillii extimus*) is a federal- and state-endangered species of migratory bird that breeds in California. Within the willow flycatcher (*Empidonax traillii*) species there are four subspecies: *E. t. adastus*, *E. t. bresteri*, *E. t. extimus* and *E. t. traillii*. Of the four recognized subspecies, the southwestern willow flycatcher breeds in southern California, Arizona, New Mexico, southwestern Colorado, the extreme southern portions of Nevada and Utah, and in northern Mexico (USFWS 2002). All of the willow flycatcher subspecies overwinter in the subtropical and tropical regions of Mexico, Central America and northern South America (Sedgwick 2000, Koronkiewicz 2002)

The southwestern willow flycatcher is a small bird with a grayish back and wings, light gray-olive breast, pale yellowish belly, two visible white wing bars and a faint or absent eye ring (USFWS 2013). Because it is very difficult to visually distinguish among the four subspecies of willow flycatcher most field biologists use their distinct songs to identify them (USFWS 2013). Southwestern willow flycatchers are insectivores, catching the majority of insects while in flight or by gleaning them from foliage (Sedgewick 2000, Durst 2004).

The southwestern willow flycatcher breeds from near sea level to approximately 3,000 feet within the state of California, but has been observed at over 8,500 feet in Arizona (Sogge et al. 1997a & b). Southwestern willow flycatchers breed in relatively dense, but often patchy, riparian tree and shrub communities with surface water and/or saturated soils (Sogge and Marshall 2000, USFWS 2002, Ahlers and Moore 2009). Breeding habitats can vary in size, but it has been demonstrated that this subspecies requires habitat widths be greater than 10 m (33 feet); however, migrating flycatchers will use a wider array of habitats such as narrower linear swaths of riparian vegetation (Sogge et al 1997a & b).

Southwestern willow flycatchers migrate approximately 1,500 to 8,000 km (930 to 4,970 miles) one-way and generally arrive at breeding grounds between early May and early June (Sogge et al. 1997a & b). This subspecies build open-cup nests and lay eggs between late May and June with an average clutch size of 2 to 5 eggs (USFWS 2013). Young birds frequently fledge from nests in early to mid-July and migration from breeding grounds to wintering grounds occurs in August and September (USFWS 2013).

“The greatest historical factor in the decline of the southwestern willow flycatcher is the extensive loss, fragmentation and modification of riparian breeding habitat (USFWS 2002).” Alteration and/or loss of habitat continues to occur as a result of urban, recreational and agricultural development, water diversion and impoundment, channelization, livestock grazing, and encroachment of habitat by exotic species of plants (Marshall and Stoleson 2000, USFWS 2002). Southwestern willow flycatchers are additionally subject to nest-parasitism from cowbirds (USFWS 2013).

4.3.7.1. SURVEY RESULTS

Caltrans did not conduct focused surveys for the southwestern willow flycatcher along Olancha Creek due to the absence of suitable nesting habitat. The determination that potentially suitable nesting habitat is not present along Olancha Creek, either within or adjacent to the proposed alignment, resulted from observations made during two on-site habitat assessments coupled with information obtained from individuals with a demonstrated knowledge of the species. A detailed rationale for this determination is outlined below.

On October 12, 2012 Ms. Cornwell completed a habitat assessment along portions of Olancha Creek located within and adjacent to the BSA. Based on an in-office literature review of the species and their preferences for nesting habitat, Ms. Cornwell determined that although nesting habitat was not observed within or adjacent to the BSA, potential migratory and/or foraging habitat does exist within and/or adjacent to the BSA. Ms. Cornwell contacted Ms. Debra Hawk (CDFW) to discuss her habitat assessment and to get feedback from Ms. Hawk on the bird's habitat preferences. Ms. Hawk agreed that the habitat along Olancha Creek is unlikely to support nesting southwestern willow flycatchers, but that it is a possibility the species uses the area for foraging and/or migratory activities.

On February 6, 2013, Jenny Richardson, a Caltrans biologist with previous experience surveying for the southwestern willow flycatcher, made a site visit to further assess the on-site habitat with regard to potential for the southwestern willow flycatcher. Ms. Richardson agreed that no nesting habitat exists within or adjacent to the BSA, though there may be potential nesting habitat along other segments of the creek, which would support the possibility of the species to use the BSA for foraging and/or migratory activities.

February 8, 2013: Ms. Cornwell contacted Ms. Debbie House, (Watershed Resource Specialist for the Los Angeles Department of Water and Power) to obtain her opinion on the potential for southwestern willow flycatcher habitat along Olancha Creek. Ms. House stated that the minimum width for nesting habitat for the southwestern willow flycatcher is approximately 33 feet, as described in the *Southwestern Willow Flycatcher Recovery Plan*. Ms. House relayed she had measured the width of the creek, using high resolution aerial imagery, and that the creek averages less than 33 feet in width, so based on width alone, a case could probably be made that suitable nesting habitat is not present.

Based on the information obtained from the two habitat assessment site visits and the clarification that the riparian corridor along Olancha Creek is not of sufficient width to support southwestern willow flycatcher nesting activities, Caltrans determined that it is appropriate to rule out the potential for nesting activities. Futhermore, based on a lack of recent occurrence data in the larger vicinity of the project site, it has been determined that although the Olancha Creek corridor may contain potential foraging habitat, due to the great distance between the project site and recent documented nesting sites in the county (the closest being approximately 30 miles north of the project site, near the town of Independence), it is more likely currently being used only for migratory stop-over's (CNDDB 2013).

4.3.7.2. Avoidance and Minimization Measures

The following measures will be employed to avoid impacts to any potential migrating southwestern willow flycatchers.

1. Any clearing and grubbing along Olancha Creek will be completed prior to or after the southwestern willow flycatcher migratory season (approximately May through June and Mid-August to September), or if this is determined to be unfeasible, a biologist(s), with demonstrated experience with the identification of the southwestern willow flycatcher, will conduct focused clearance surveys in both direct and indirect impact areas, prior to the onset of clearing and grubbing.

   If conducted, the surveys will follow the most current USFWS southwestern willow flycatcher survey protocol. If any southwestern willow flycatchers are observed in direct or indirect impact areas during the clearance surveys, the following additional avoidance measures will be implemented:

   a. The USFWS will be consulted to determine the best way to avoid disturbance to the species during construction;

   b. A biologist will be present to monitor any subsequent project related activities along Olancha Creek that occur during the migratory season.

   c. The Caltrans CI, upon request by the monitor, will have the authority to stop any and/or all project activities until appropriate corrective measures have been completed. Therefore, if a southwestern willow flycatcher is observed during construction, monitor will ask the CI to halt the construction activities in the vicinity of Olancha Creek until the monitor indicates that work may resume.

2. Prior to the onset of any construction-related activities the monitor shall provide all personnel who will be present on the work site with a mandatory worker education training which will include the following information:

   a. A description of the southwestern willow flycatcher and its' habitat preferences;

   b. Color photographs of the bird as well as an audio sample of the bird's calls;

c. A description of the protection the southwestern willow flycatcher receives under the Federal and State Endangered Species Acts and possible legal action that may be incurred for violation of the Acts as well as a discussion on the definition of “take”.

3. Riparian habitat located adjacent to the new RoW will be fenced in a manner that prevents equipment and vehicles from straying from the designated work area and into the adjacent habitat. The monitor will assist in determining the boundaries of the area to be fenced and will be present when the protective fencing is installed. All workers will be advised that equipment and vehicles must remain within the fenced work areas.

4. All trash that may attract predators of the southwestern willow flycatcher will be removed from work sites or completely secured at the end of each work day to avoid attracting predators of the species.

The measures outlined above will be implemented to avoid “take” of the southwestern willow flycatcher. In addition, the following measure will also be employed to minimize effects of the constructed project on the southwestern willow flycatcher.

5. Following the construction activities, native *Populus fremontii* and *Salix gooddingii* plantings will be installed along the outer portions of the Caltrans RoW along the creek. The proposed plantings will be installed along the edge of the RoW that is adjacent to the undisturbed riparian habitat located just beyond the RoW. Over time, the installed RoW plantings will act to provide a visual and audio buffer between highway traffic and the potential migratory habitat located up and downstream of the Caltrans RoW, thus minimizing the effect of the constructed project on the southwestern willow flycatcher.

4.3.7.3. PROJECT IMPACTS

Direct Impacts:

Approximately 0.35 acres of potential migratory habitat for the southwestern willow flycatcher will be directly impacted within the PIA as a result of paving the proposed alignment. An additional 0.16 acres of potential migratory habitat located adjacent to the PIA, within the RoW, will also be directly impacted through the removal of vegetation. Although the vegetation will regenerate in the area over time, this too has been considered a permanent impact, thus making a total of 0.51 acres of direct permanent impacts to potential southwestern willow flycatcher migratory habitat (Figure 15).

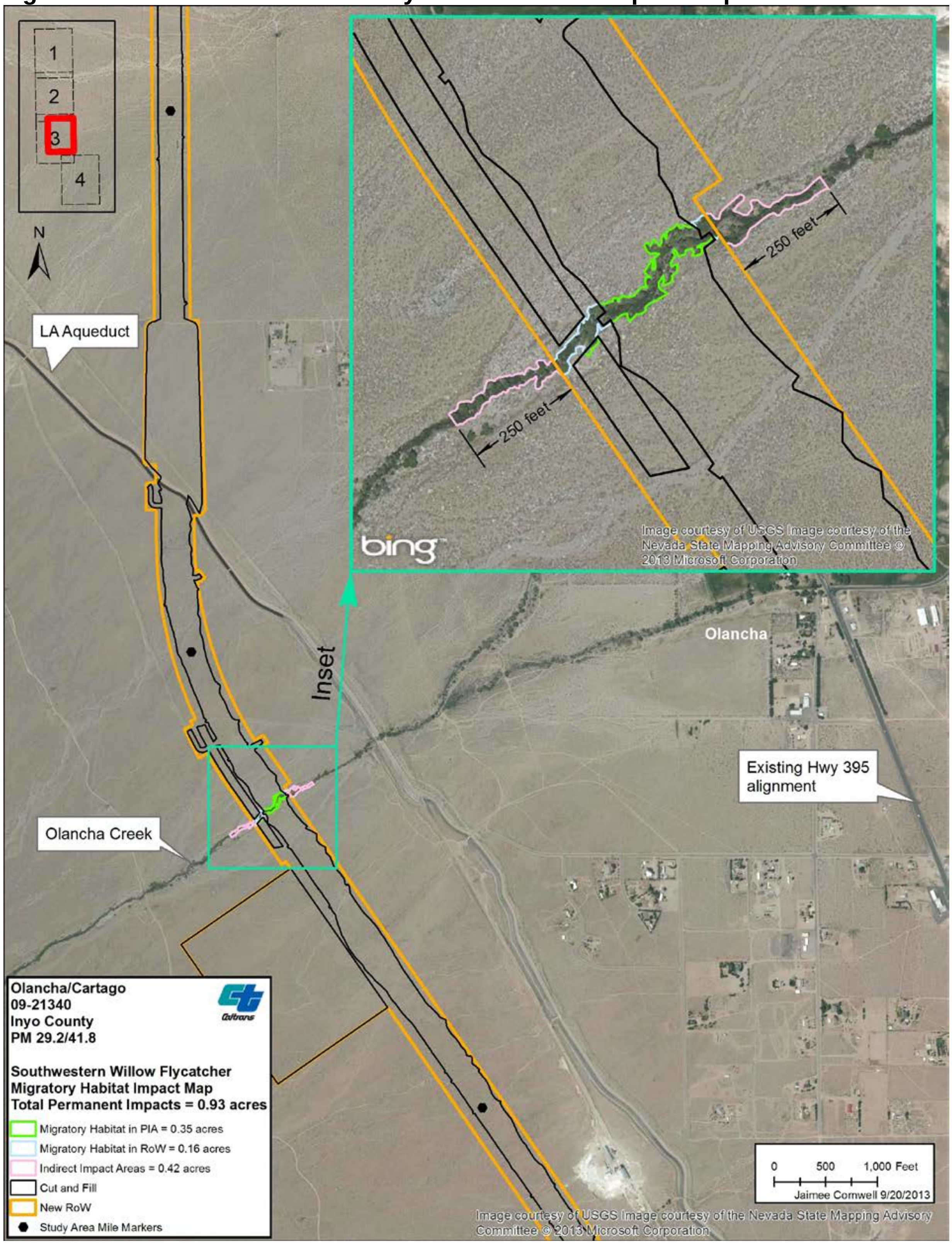
Indirect Impacts:

Although Caltrans is going to install some native Fremont cottonwood (*Populus fremontii)* and Goodding's black willow (*Salix gooddingii*) plantings along the outer edge of the RoW to minimize indirect impacts to the southwestern willow flycatcher, it is anticipated that the introduction of noise, dust, light and vehicle activity could act to reduce the migratory potential in areas adjacent to the RoW. These indirect impacts have been accounted for using a 250-foot buffer that encompasses the riparian habitat located up- and downstream from the edge of the RoW (Figure 15). The 250-foot indirect impact area buffer was determined based on the 500-foot buffer width that is commonly used in areas with potentially suitable southwestern willow flycatcher nesting habitat. Because the proposed impact area along Olancha Creek is not deemed potential flycatcher nesting habitat, a 250-foot buffer will be used to off-set the possibility of indirect impacts to the potential migratory habitat located outside of and adjacent to the new Caltrans RoW. The 250-foot indirect impact area occupies approximately 0.42 acres and has also been calculated as a permanent impact.

4.3.7.4. COMPENSATORY MITIGATION

The project site is not located within designated southwestern willow flycatcher Critical Habitat and it has been determined that potential nesting habitat does not exist within or adjacent to the new RoW. Therefore, a total of 0.93 acres of potentially suitable southwestern willow flycatcher migratory habitat will be compensated for to provide mitigation for 0.35 acres of direct impacts in the PIA, 0.16 acres of direct impacts in the new RoW and 0.42 acres of indirect impacts to the 250-foot buffered areas outside and adjacent to the new RoW. Mitigation for the 0.93 acres of permanent impacts will be accomplished at a 2:1 ratio through the enhancement, restoration or preservation of riparian habitat that also benefits the southwestern willow flycatcher, as approved by the USFWS and CDFW.

Figure 15: Southwestern Willow Flycatcher Habitat Impact Map



4.3.8. Discussion of the Yellow-breasted Chat

The Yellow-breasted chat (*Icteria virens*) is a California Species of Concern according to the CDFW. This species is an uncommon summer breeder and migrant in coastal California, the foothills of the Sierra Nevada and desert riparian habitats in the eastern Sierra Nevada (CDFW 2005). This species arrives in California in late March and stays until late September, with breeding occurring between late April and early August (Garrett and Dunn 1981, Eckerle and Thompson 2001, Unitt 2004).

The yellow-breasted chat prefers early successional riparian habitats with a thick, well-developed shrub layer and an open canopy (2008 CDFW). Nesting chats are typically found in species of shrubs that form dense thickets, such as: willow (*Salix* spp.), blackberry (*Rubus* spp.) and wild grape (*Vitis* spp.) with taller cottonwood (*Populus* spp.) or alder (*Alnus* spp.) trees that can be used for song perches (Grinnell and Miller 1944, Dunn and Garrett 1997). This species numbers have declined as a result of habitat degradation and nest parasitism by the brown-headed cowbird (Gaines 1974a, Remsen 1978)

4.3.8.1. Survey Results

Focused surveys for the yellow-breasted chat were not conducted and no yellow-breasted chats were observed during any of the project's field studies. Furthermore the most recent documented occurrences of this species in close proximity to the project site date back to 1891 and the closest more recent (1992) documented occurrence of this species was in the Alabama Hills Recreation Area, approximately 7 miles northwest of Lone Pine and approximately 23 miles from the project site(CNDDB 2013).

4.3.8.2. Avoidance and Minimization Measures

The yellow-breasted chat is not expected to occur within the project site; however, pre-construction migratory bird surveys will act as a built-in avoidance measure that will benefit this species if they do happened to nest within the project site.

4.3.8.3. Project Impacts

The yellow-breasted chat is not expected to occur in the project site so no impacts to this species are anticipated.

4.3.8.4. Compensatory Mitigation

No compensatory mitigation is proposed.

4.3.9. Discussion of the Loggerhead shrike

The Loggerhead shrike (*Lanius ludovicianus*) is designated as a California Species of Concern by the CDFW and is both a common resident and winter visitor within the state (Grinnell and Miller 1944, Yosef 1996). In the Owen's Valley, the loggerhead shrike migrates to the southern deserts to over-winter (Small 1994, CDFW 1988-1990). The loggerhead shrike lays eggs from March into May and young fledge and are independent in July or August (CDFW 1988-1990). This species occupies open habitats and is most abundant in open-canopied valley foothills hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian and Joshua tree habitats (CDFW 1988-1990). This species also requires the presence of perches for hunting, and sharp, thorned, or multi-stemmed plants or barbed wire fencing for the impalement of prey, which allows birds to manipulate and eat, or cache, their food items (Yosef 1996, Pruitt 2000).

The loggerhead shrike's breeding range still extends throughout much of the state of California; however, populations have declined or been extirpated locally, which reflects an overall statewide decline in this species numbers (Saucer et al. 1996 and 2005, Hamilton and Willick 1996, Bolander and Parmenter 2000, Unitt 2004). Threats to the loggerhead shrike are reported as poorly understood within California and the West as a whole, but the loss and degradation of habitats used for breeding, wintering and migration are significant factors (Pruitt 2000). Therefore, increased urbanization, encroachment of exotic species of grasses and forbs, which has been shown to alter fire regimes- another noted factor in this species decline, are all contributing factors, as is vehicle mortality and the likelihood of chemical pesticide contaminants, which reduce egg shell thickness and development in young (Busbee 1977, Kridelbaugh 1981, Blumton et al. 1990, Stevenson and Anderson 1994, Flickenger 1995, Pruitt 2000, Brooks and Pike 2001, Humple and Holmes 2006).

4.3.9.1. SURVEY RESULTS

Although no focused surveys for the loggerhead shrike were conducted, this species was observed several times during the project surveys (Mohave ground squirrel surveys in 2001 and 2002, Desert tortoise surveys in 2001 and 2012).

4.3.9.2. AVOIDANCE AND MINIMIZATION MEASURES

Tree and vegetation removal has been proposed to occur between approximately September and February, outside of the nesting season, unless deemed unfeasible and subsequently pre-authorized by the project biologist. Pre-construction migratory bird clearance surveys will be conducted both prior to any clearing and grubbing, and prior to the start of construction, if these activities do not occur concurrently. If any nesting loggerhead shrikes are discovered within the project site, an ESA and construction buffer will be established around the nest until young have fledged.

4.3.9.3. PROJECT IMPACTS

No impacts to individual loggerhead shrikes are anticipated to occur during construction of the project; however, loss of habitat, resulting from the constructed project would indirectly impact this species through the removal of approximately 651.28 acres of presently undeveloped land.

4.3.9.4. COMPENSATORY MITIGATION

Although no compensatory mitigation is specifically proposed for impacts to loggerhead shrike habitat, mitigation for the 651.28 acres of impacts to desert tortoise habitat are expected to benefit the loggerhead shrike as well.

4.3.10. Discussion of Le Conte's Thrasher

The Le Conte's thrasher (*Toxostoma lecontei*) is listed as a non-migratory California Species of Concern by the CDFW. This species is an uncommon to rare local resident in the southern California deserts from southern Mono County to the Mexican border and in the western and southern San Joaquin Valley (CDFW 2008). This species prefers habitats with scattered shrubs and is commonly found in open desert wash, desert scrub, alkali desert scrub, succulent desert shrub habitats and in Joshua Trees with scattered shrub cover (CDFW 2008).

Breeding occurs from late January to early June, with a peak between mid-March and mid April (CDFW 2008). This species numbers have declined in recent decades due to habitat loss and degradation resulting from development, conversion of native habitat to agriculture, over-grazing of cattle and fire, all of which contribute to the fragmentation of existing suitable habitat. The Le Conte's thrasher has been described as "extremely wary of humans" and further, has such a specialized ecological niche, so it is likely this species may be more sensitive to those factors listed above, when compared with other species also facing the loss and degradation of habitat (Remsen 1978).

4.3.10.1. SURVEY RESULTS

Focused surveys for the Le Conte's thrasher were not included for this project; however, this species was observed during the project field work.

4.3.10.2. Avoidance and Minimization Measures

Prior to any clearing and grubbing, migratory bird clearance surveys will be completed, although this species is not covered under the Migratory Bird Treaty Act, if any nesting Le Conte's thrashers are discovered in the project site, an ESA will be established around the nest and will include a protective buffer to avoid disturbance to the nesting pair until their young have fledged.

4.3.10.3. Project Impacts

No impacts to this species are anticipated during construction; however, this species could be affected by the loss potentially suitable habitat; although, cattle grazing already occurs on the project site.

4.3.10.4. Compensatory Mitigation

The purchase of mitigation lands for compensation of impacts to the on-site desert tortoise habitat is expected to also provide suitable habitat for the Le Conte's thrasher, at a higher acreage and quality, than that which presently exists on the project site.

4.3.11. Discussion of the Least Bell's Vireo

The least Bell's vireo (*Vireo bellii pusillus*) is a federal- and state-endangered species of migratory bird that breeds in California. The least Bell's vireo is one of four subspecies of the Bell's vireo (*Vireo bellii*). The least Bell's vireo is the western-most subspecies and breeds in southern California and northern Baja California (Kus 2002). The least bell's vireo overwinters in southern Baja California where they occupy a diverse range of habitat types, such as: mesquite shrub within arroyos, palm groves, and hedgerows that border agricultural and residential areas (Kus 2002).

The least Bell's vireo is a small passerine that is mostly grayish with white underparts, two pale wingbars, indistinct "spectacles" and a dark tail (Ridgeway 1904, National Geographic Society 1983, Peterson 1990). The least Bell's vireo has a distinctive and complex song and is generally heard, rather than seen (Patten). The least bell's vireo is an insectivore and obtains the majority of its prey while hovering above vegetation or gleaning insects from foliage (Hammerson 1996).

Least Bell's vireo have been documented breeding between -175 feet, in Death Valley, to as much as 4,100 feet in Bishop, CA (Grinnel and Miller 1944). The least Bell's vireo selects dense riparian habitats, frequently dominated by willow and mulefat (*Baccharis salicifolius*) or occupied by oak woodland with willow in the understory, for breeding and nesting, with nests being located in the active flood plain of waterways (Goldwasser 1981, Gray and Greaves 1984, Franzereb 1989).

Least Bell's vireo begin migrating to their breeding grounds in southern California in mid- to late March (Kus 2002). Nesting typically occurs from early April until the end of July. The birds build an open-cup nest and an average clutch contains 4 eggs (Kus 2002). Young birds leave the nest after only 10 to 12 days; however, juvenile birds stay with adults for approximately one month (Hammerson 1996). Migrating vireo' commonly leave their breeding/nesting grounds between late July and late September (Kus 2002).

Historical records of the Least Bell's vireo described them as being common during the late 1800's and early 1900's (Cooper 1861, Anthony 1893 and 1895, Baird et al. 1874, Belding 1878, Fisher 1893, Grinnell and Swarth 1913, Grinnell and Storer 1924, Grinnell et al. 1930, Grinnell and Miller 1944). When the species was listed by the USFWS in 1986, it was absent in the majority of its historic range and only 300 pairs remained in the state of California (Kus 2002). Major threats to the least Bell's vireo include loss of dense breeding habitat due to agricultural, urban and commercial developments, flood control and river channelization projects, livestock grazing, as well as nest parasitism by cowbirds, which has been a significant factor in the birds' decline (Franzreb 1989). It should be noted that numbers of least Bell's vireo have been increasing since the mid-1990's due to habitat restoration and cowbird control efforts. In 2002 Barbara Kus reported "in the decade since listing, Least Bell's vireo numbers have increased 6-fold, and the species is expanding into its historical range."

4.3.11.1. SURVEY RESULTS

Caltrans did not conduct focused surveys for the least Bell's vireo along Olancha Creek due to the absence of suitable nesting habitat, which was initially suspected during the habitat assessment site visit on October 3, 2012. Subsequent in-office research and correspondence with local ornithologists, and/or professionals with a demonstrated knowledge of the species, confirmed that suitable nesting habitat is not present within or immediately adjacent to the project site. Read the agency and professional contact communications below for greater detail on the rationale for presuming that habitat for the least Bell's vireo is not present within the project site.

On January 30, 2013 Ms. Cornwell contacted Ms. Nordin to discuss with her the potential for the least Bell's vireo along Olancha Creek. Ms. Nordin relayed that USFWS still includes the vireo on their species list because the species historically occurred in Olancha, but unless there has been a project in the area, and the species has been surveyed for recently, the USFWS does not have recent information to indicate presence or absence. Ms. Nordin suggested Ms. Cornwell contact CDFW or a local bird watching group to obtain more recent information on the potential presence of this species.

On January 31, 2013 Ms. Cornwell spoke with Mr. John Heindel (Eastern Sierra Audubon Society) to discuss the potential for the least Bell's vireo to be present on, or near to the project site. John relayed that no least Bell's vireo have been documented in Olancha for at least fifty years. He further stated that their presence has not been documented in Lone Pine or Bishop either. John mentioned that due to cowbird trapping efforts in southern California, the species range is expanding. John said that he and his wife (both are long-time birders who reside in Lone Pine, CA) use BLM data, university data, as well as other available scientific data, but that he has not seen any (recent) data compiled for the least Bell's vireo near Olancha.

On February 5, 2013 Ms. Cornwell contacted Mr. Jonathan Dunn (an expert birder in Inyo County) to ask if he had any recent information on the least Bell's vireo in Inyo County. Mr. Dunn told Ms. Cornwell that he had not personally seen any least Bell's vireo in Inyo County, aside from at the China Creek Ranch (east of Tecopa) and once at the Furnace Creek Ranch in Death Valley National Park. He said he knew of one bird that was present for two consecutive summers along the Owens River just east of Big Pine, but then pointed out that the species is still extremely rare in Kern County, but that perhaps as the species recovers in southern California, there will be more birds. Mr. Dunn also mentioned that the subspecies identity (*arizonae* or *pusillus*) of the birds observed at the China Creek Ranch is open to question.

On February 8, 2013 Ms. Cornwell contacted Ms. Debbie House (Los Angeles Department of Water and Power) to ask if she knew of any recent documented occurrence data for the least Bell's vireo in the vicinity of the project site. Ms. House commented that the habitat along Olancha Creek does not look like least Bell's vireo habitat because the species is typically found in wide active floodplains. Ms. House also mentioned that the only nesting Bell's vireo that she has known of are in the Tecopa area (of southeast Inyo County), and a pair, that she documented a few years ago who only nested for one year, on the Owens River near Big Pine. Ms. House further stated the potential for least Bell's vireo in the project area is pretty limited and that she would not worry about this species occurring within the project area.

It should also be noted that no recent occurrence data exists for the Least Bell's vireo within the vicinity of Olancha or the greater surrounding area; the most recent documented occurrence in Inyo County was in 1978 at China Ranch, south of Tecopa, which is over 100 air miles from the project site.

4.3.11.2. Avoidance and Minimization Measures

Clearing and grubbing along Olancha Creek is anticipated to occur outside of the migratory bird breeding season; however, migratory nesting bird surveys will be completed prior to any ground disturbance and/or removal of vegetation.

4.3.11.3. Project Impacts

No potentially suitable habitat exists within the project site for the least Bell's vireo; therefore, no impacts to this species will occur as a result of the project.

4.3.11.4. Compensatory Mitigation

There will not be any impacts to the least Bell's vireo, or their habitat; therefore, no compensatory mitigation is proposed.

4.3.12. Discussion of the Pallid Bat

The pallid bat (*Antrozous pallidus*) is designated a California Species of Concern by the CDFW and Section §2126 of the CDFW Code states that it is unlawful for any person to take any mammal identified by Section §2118, which includes all species of the Order Chiroptera (bats). The pallid bat is also listed as a sensitive species according to the BLM and bat roosts are considered a sensitive resource according to the CDFW where avoidance, minimization, and/or replacement of habitat should be addressed.

Pallid bats occupy a wide range of habitats including desert wash, Great Basin grasslands, Great Basin scrub, Mojavean desert scrub and riparian woodland (CNDDB 2013). However, they are most common in dry open habitats with rocky areas where they can roost and gain protection from the high temperatures (CNDDB 2013). One of the most prominent threats to this species is the disturbance of roosting sites- to which they are quite sensitive; other threats include development and renewal of mining operations (CNDDB 2013).

4.3.12.1. Survey Results

Bat surveys were conducted in 2001 and the pallid bat was among the species of bats that were detected.

4.3.12.2. Avoidance and Minimization Measures

No avoidance or minimization measures are proposed for the pallid bat because although they are likely use the project site for feeding, there are no rocky areas to provide roosting habitat within the project site.

4.3.12.3. Project Impacts

The removal of approximately 0.51 acres of potentially suitable feeding habitat along Olancha Creek could impact the pallid bat by removing portions of presently available feeding habitat; however, the additional available feeding habitat in the larger vicinity of the project site, that will not be impacted by the project, is expected to continue to provide sufficient feeding opportunities for this species.

4.3.12.4. Compensatory Mitigation

No compensatory mitigation is proposed.

4.3.13. Discussion of the Townsend's big-eared bat

The Townsend's big-eared bat is a candidate for being listed as a state-threatened species by the CDFW and is presently listed as sensitive by the BLM. The Townsend's big-eared bat is typically found in broad-leaved upland forest, chaparral, chenopod scrub, Great Basin grasslands and Great Basin scrub habitats (CDFW 2014). This species is most common in mesic sites and roosts in the open, hanging from walls and ceilings of old mines, caves and other suitable roosting areas.

Townsend's big-eared bats do not migrate, but hibernate during the colder months (Gruver and Keinath 2006). Although no documented occurrence data exists for this species within the project USGS quadrangles, or those surrounding them, it has been suggested that this species is frequently present in habitats found to be suitable for the pallid bat, which was detected on the project site during the 2001 bat surveys (BLM 2014).

4.3.13.1. Survey Results

Bat surveys were conducted in 2001 and the pallid bat was among the species of bats that were detected; therefore, the Townsend's big-eared bat may be present on the project site as well.

4.3.13.2. Avoidance and Minimization Measures

No avoidance or minimization measures are proposed for the Townsend's big-eared bat because it has not been confirmed that this species is present on the project site, and if this species is present, they likely only use the project site for feeding, as there are no rocky areas to provide roosting habitat on the site.

4.3.13.3. PROJECT IMPACTS

The removal of approximately 0.51 acres of potentially suitable feeding habitat along Olancha Creek could impact the Townsend's big-eared bat, if present, by removing portions of presently available feeding habitat. However, the additional feeding habitat available in the larger vicinity of the project site, which will not be impacted by the project, is expected to continue to provide sufficient feeding opportunities for this species.

4.3.13.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed.

4.3.14. Discussion of the Spotted Bat

The spotted bat (*Euderma maculatum*) is designated a California Species of Concern by the CDFW and Section §2126 of the CDFW Code states it is unlawful for any person to take any mammal identified by Section §2118, which includes all species of the Order Chiroptera (bats). The spotted bat is also listed as a sensitive species according to the BLM and bat roosts are considered a sensitive resource according to the CDFW where avoidance, minimization, and/or replacement of habitat should be addressed.

Spotted bats occupy a wide range of habitats including desert lands, grasslands and mixed conifer forests (CNDDB 2013). Spotted bats feed over water and desert washes and roost in rock crevices in cliffs and caves (CNDDB 2013). Potential threats to the spotted bat's habitat include: development, timber harvest, recreation and cattle grazing (CNDDB 2013).

4.3.14.1. SURVEY RESULTS

Bat surveys were conducted in 2001 and the spotted bat was among the species of bats that were detected in the project site.

4.3.14.2. AVOIDANCE AND MINIMIZATION MEASURES

No avoidance or minimization measures are proposed for the spotted bat because although they have been shown to use the project site for feeding, there are no rock crevices, cliffs or caves to provide roosting habitat for this species in the project site.

4.3.14.3. PROJECT IMPACTS

The removal of approximately 0.51 acres of potentially suitable feeding habitat along Olancha Creek, as well as additional portions of the dry washes that cross through the new alignment could impact the spotted bat by removing portions of presently available feeding habitat; however, the additional available feeding habitat in the larger vicinity of the project site, that will not be impacted by the project, is expected to continue to provide sufficient feeding opportunities for this species.

4.3.14.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed.

4.3.15. Discussion of the Silver-haired Bat

The Silver-haired bat (*Lasionycteris noctivagans*) is protected under Section §2126 of the CDFW Code, which states it is unlawful for any person to take any mammal identified by Section §2118, which includes all species of the Order Chiroptera (bats). In addition, bat roosts are considered a sensitive resource by the CDFW where avoidance, minimization, and/or replacement of habitat should be addressed.

This species shows a preference for temperate, northern hardwood in the vicinity of ponds and streams. This species commonly roosts behind loose tree bark, such as that of the willow (*Salix* spp.), maple (*Acer* spp.) or ash (*Fraxinus* spp.) as well as in snags and bird nests (International Union for Conservation of Nature and Natural Resources (IUCN) 2013). Silver-haired bats feed over water and open brushy habitats and require drinking water (CDFW 2013). Potential threats to the silver-haired bat likely include: timber harvest, forest fires and changes in local hydrologic regimes.

4.3.15.1. SURVEY RESULTS

The silver-haired bat was not detected during the 2001 surveys; however, there is a potential for this species to roost in the riparian habitat along Olancha Creek.

4.3.15.2. AVOIDANCE AND MINIMIZATION MEASURES

There is a potential for silver-haired bats to roost within the trees along Olancha Creek. Therefore, to avoid potential impacts to this species, any trees identified for removal will be studied for the presence of loose or peeling bark prior to the on-set of clearing and grubbing. If any trees with potential habitat are discovered they would be avoided, or if avoidance is not feasible, impacts would be minimized through the careful removal of the loose bark, prior to the removal of the tree.

4.3.15.3. PROJECT IMPACTS

The removal of approximately 0.51 acres of riparian habitat along Olancha Creek, could impact the silver-haired bat by removing potential roosting habitat.

4.3.15.4. COMPENSATORY MITIGATION

Although no compensatory mitigation is specifically proposed for the silver-haired bat, mitigation for the 0.93 acres of potential southwestern willow flycatcher migratory habitat along Olancha Creek is expected to also benefit the silver-haired bat.

4.3.16. Discussion of the Owen's Valley Vole

The Owen's Valley vole (*Microtus californicus vallicola*) is designated a California Species of Concern by the CDFW and is listed as sensitive by the BLM. Little is known about the status of this species population. It is thought that climate change and mountain barriers that developed during the Pleistocene genetically isolated this species from other populations of California voles for more than 14,000 years (CDFW 2013). Fragmentation of this species habitat has resulted from natural aridity and urban, infrastructure and agricultural developments; therefore the number of subpopulations is currently unknown (USFWS 1998).

4.3.16.1. Survey Results

This species was captured outside of the selected 4-3 Hybrid alignment during the Mohave ground squirrel trapping efforts that were conducted in 2001 and 2002.

4.3.16.2. Avoidance and Minimization Measures

Avoidance of impacts of this species and its habitat (wetlands) were minimized as much as was feasible during the project development.

4.3.16.3. Project Impacts

Approximately 0.122 acres of wetland habitat, which may be suitable habitat for the Owen's Valley vole, will be impacted by the proposed project.

4.3.16.4. Compensatory Mitigation

Compensation for impacts to the on-site wetlands is expected to also benefit the Owen's Valley vole, as long as mitigation efforts are able to be accomplished within the Owen's Valley.

4.3.17. Discussion of the Long-legged Myotis

The Long-legged myotis (*Myotis volans*) is protected by Section §2126 of the CDFW Code, which states it is unlawful for any person to take any mammal identified by Section §2118, which includes all species of the Order Chiroptera (bats). In addition, bat roosts are considered a sensitive resource by the CDFW where avoidance, minimization, and/or replacement of habitat should be addressed.

The long-legged myotis is most commonly found in woodland and forest habitats above 4000 feet in elevation. Trees are used for day roosts and night roosting occurs within caves and/or mines (CDFW 2013). Nursery colonies are typically located under tree bark or in snags, but have also been observed in crevices or buildings (CDFW 2013). The most common threats to this species are: timber harvest, reinstatement of mining activities and disturbance caused from human presence and grazing cattle (CDFW 2013).

4.3.17.1. Survey Results

The long-legged myotis was one of the species of bats that were detected during the 2001 surveys, so there is potential for this species to use the habitat along Olancha Creek for day roosting and/or nursery colonies.

4.3.17.2. Avoidance and Minimization Measures

There is a potential for the long-legged myotis to roost within the trees along Olancha Creek and in the building proposed for demolition. Therefore, to avoid potential impacts to this species, any trees identified for removal will be studied for the presence of loose or peeling bark prior to the on-set of clearing and grubbing. If any trees with potential habitat are discovered they would be avoided, or if avoidance is not feasible, impacts would be minimized through the careful removal of the loose bark, prior to the removal of the tree. Furthermore, pre-demolition surveys will be completed in the building that is to be removed and if needed, bat exclusion will be installed to prevent this species from roosting in the building prior to its demolition.

4.3.17.3. Project Impacts

The removal of approximately 0.51 acres of riparian habitat along Olancha Creek, could impact the long-legged myotis by removing potential roosting habitat.

4.3.17.4. Compensatory Mitigation

Although no compensatory mitigation is specifically proposed for the long-legged myotis, mitigation for the 0.93 acres of potential southwestern willow flycatcher migratory habitat along Olancha Creek is expected to also benefit this species.

4.3.18. Discussion of the Yuma Myotis

The Yuma myotis (*Myotis yumaensis*) is protected under Section §2126 of the CDFW Code, which states it is unlawful for any person to take any mammal identified by Section §2118, which includes all species of the Order Chiroptera (bats). The Yuma myotis is also listed as a sensitive species according to the BLM and bat roosts are considered a sensitive resource according to the CDFW where avoidance, minimization, and/or replacement of habitat should be addressed.

The Yuma myotis is most commonly found in open woodland and forested habitats with a source of water, over which the bats can feed (CDFW 2013). Maternity colonies and roosts are located in caves, mines, crevices and buildings as well as under bridges (CDFW1998-1990). The most common threats to this species are: human disturbance, reinstatement of mining activities and development (CDFW 2013).

4.3.18.1. SURVEY RESULTS

The Yuma myotis was one of the species of bats that were detected during the 2001 surveys, so this species likely uses the project site for feeding.

4.3.18.2. AVOIDANCE AND MINIMIZATION MEASURES

There is the potential for the Yuma myotis to roost or have a nursery colony in the building proposed for demolition. Therefore, to avoid impacts to this species, the building will be surveyed prior to its demolition and if needed, bat exclusionary measures will be installed to eliminate potential roosting and nursery colony habitat within the building prior to construction.

4.3.18.3. PROJECT IMPACTS

The removal of approximately 0.51 acres of riparian habitat along Olancha Creek, could impact the Yuma myotis by removing potential feeding habitat.

4.3.18.4. COMPENSATORY MITIGATION

Although no compensatory mitigation is specifically proposed for the Yuma myotis, mitigation for the 0.93 acres of potential southwestern willow flycatcher migratory habitat along Olancha Creek is expected to also benefit this species. No mitigation is proposed for the removal of potential roosting habitat that will be removed when the building is demolished.

4.3.19. Discussion of Other Bats

Although the following three species of bats: western small-footed myotis (*Myotis cilliolabrum*), fringed myotis (*Myotis thysanodes*) and long-eared myotis (*Myotis evotis*) did not come up in any of the federal or state species lists obtained for the project, they are listed as sensitive by the BLM and were detected on-site at the time of the 2001 bat surveys.

The western small-footed myotis and fringed myotis use mines, caves, rock crevices or buildings for roosting, so there is a potential for these species to roost in the building proposed for demolition in the BSA. The long-eared myotis has been observed with nursery colonies in buildings, crevices, spaces under tree bark and in snags, so there is a potential for this species to be present in the riparian habitat along Olancha Creek.

4.3.19.1. Avoidance and Minimization

There is a potential for the western small-footed myotis and fringed myotis to roost within the building proposed for demolition. Therefore, to avoid impacts to these species, the building will be surveyed prior to its demolition and if needed, bat exclusionary measures will be installed to eliminate potential roosting habitat within the building prior to construction.

There is a potential for the long-eared myotis to have a nursery colony within the building proposed for demolition or within the trees along Olancha Creek. Therefore, to avoid impacts to this species the building will be surveyed prior to its demolition and if needed, bat exclusionary measures will be installed to eliminate potential nursery colony habitat within the building prior to construction. Furthermore, any trees identified for removal will be studied for the presence of loose or peeling bark prior to the on-set of clearing and grubbing. If any trees with potential habitat are discovered they would be avoided, or if avoidance is not feasible, impacts would be minimized through the careful removal of the loose bark, prior to the removal of the tree.

4.3.19.2. Project Impacts

The removal of approximately 0.51 acres of riparian habitat along Olancha Creek, could impact the long-eared myotis by removing potential nursery colony habitat. The removal of the building to be demolished could impact the western small-footed myotis, or fringed myotis, by removing potential roosting habitat, or could impact the and long-eared myotis by removing potential nursery colony habitat.

4.3.19.3. Compensatory Mitigation

Although no mitigation is specifically proposed for the long-eared myotis, compensatory mitigation for the 0.93 acres of potential southwestern willow flycatcher migratory habitat along Olancha Creek is expected to benefit the long-eared myotis as well. No mitigation is proposed for the removal of potential roosting or nursery colony habitat that will be removed when the building is demolished.

4.3.20. Discussion of the American Badger

The American badger (*Taxidea taxus*) is a medium to large-sized mammal with powerful short legs and long claws that are used to aid in digging (Boitani 1982). The badger's body is stout and wider than high and the fur shaggy, with a silvery grey color. The badgers head is dark and there is a white stripe that extends down the length of the animal's back; its tail is short and yellowish in color (CDFW 1995). This species is most common in drier open shrub, forested or herbaceous habitats with friable soils. Their burrows usually have one elliptical entrance, which measures approximately 8 to 12 inches in diameter, with the sides being narrower than the height. Badgers will use old burrows and are also known to dig a new burrow each night during the warm summer months. Badgers primarily feed on small mammals such as ground squirrels, gophers, mice, rats and chipmunks, but also eat birds, eggs, reptiles and carrion.

Badgers are described as being somewhat tolerant of human activities, so are relatively less sensitive to human disturbance than other species. The following factors have been shown to threaten the badger: predator control efforts that use indiscriminant trapping methods and poison, vehicle collisions and habitat loss from developments (CNDDB 2013).

4.3.20.1. SURVEY RESULTS

Focused surveys were not conducted for the badger and live badgers or their burrows were not observed in the project site during any of the surveys. Because this species or its sign were not observed during the surveys conducted throughout the study of the project site, badgers are not expected to occur in the project site.

4.3.20.2. AVOIDANCE AND MINIMIZATION MEASURES

Because the badger is not expected to occur within the project site, no avoidance or minimization measures are proposed.

4.3.20.3. PROJECT IMPACTS

No impacts to the badger are expected to occur as a result of the project.

4.3.20.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed.

4.3.21. Discussion of Mohave Ground Squirrel

The Mohave ground squirrel (*Xerospermophilus mohavensis*) is a state-threatened species and is further listed as sensitive according to the BLM. Mohave ground squirrels are small with a total length of 9 inches. These squirrels are uniformly grayish-brown above and lighter on their underside, with a distinctive white eye ring. Individuals within this species eat a variety of green vegetation, seeds and fruits, and forages on the ground or in shrubs and Joshua trees (CDFW 1990). This species utilizes a variety of habitat types within several vegetation communities dominated by creosote, shadscale, or Joshua tree.

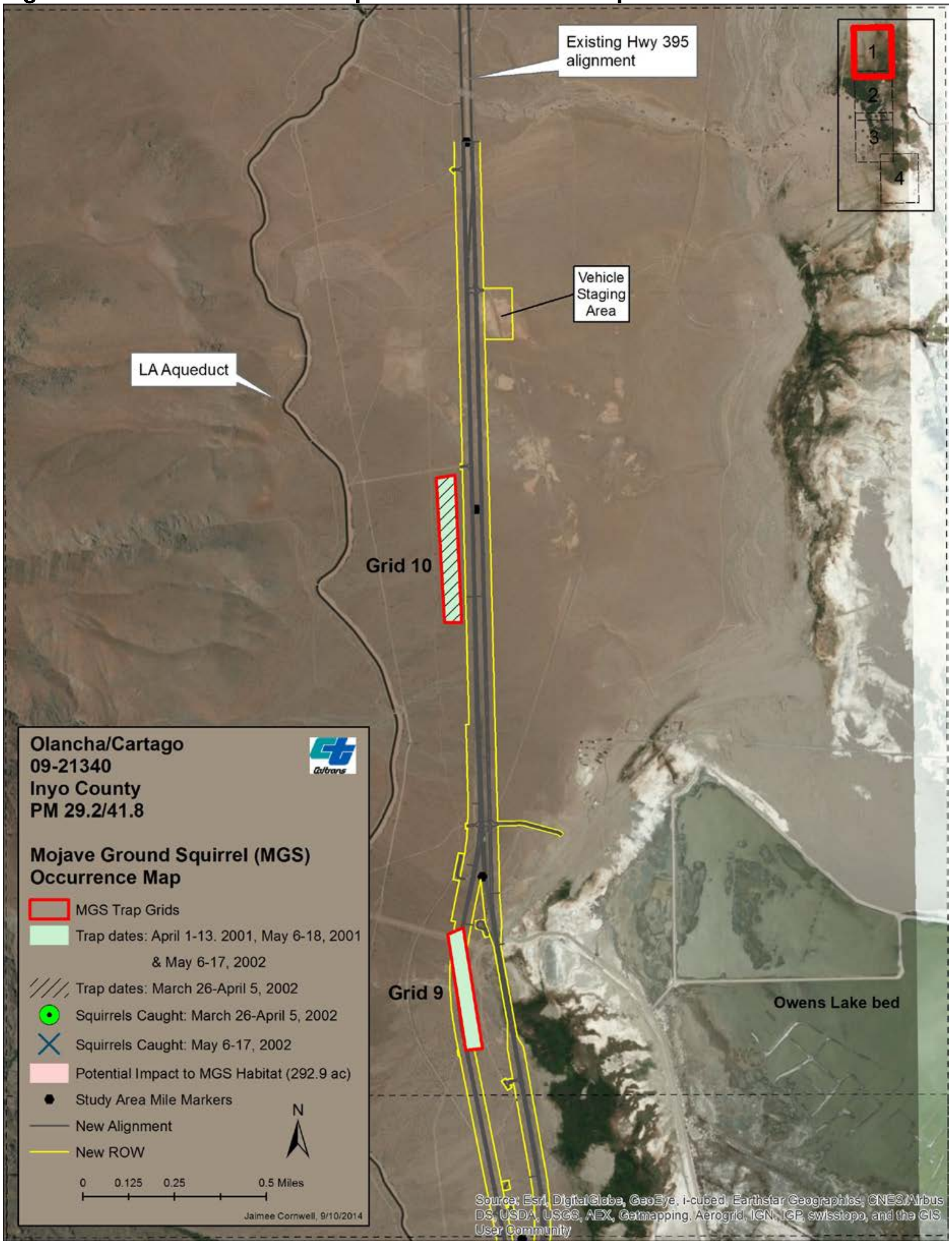
The Mohave ground squirrel occurs in the Western Mojave Desert from southwestern Inyo County, south through eastern Kern County, northeastern San Bernardino County and northeastern Los Angeles County. It has one of the smallest geographic ranges of the 28 species of ground squirrel (Hall 1981). Within this species range there have been four core areas supporting widespread populations that have been identified by Mohave ground squirrel researchers (Leitner 2005). The proposed project bisects one of these core areas.

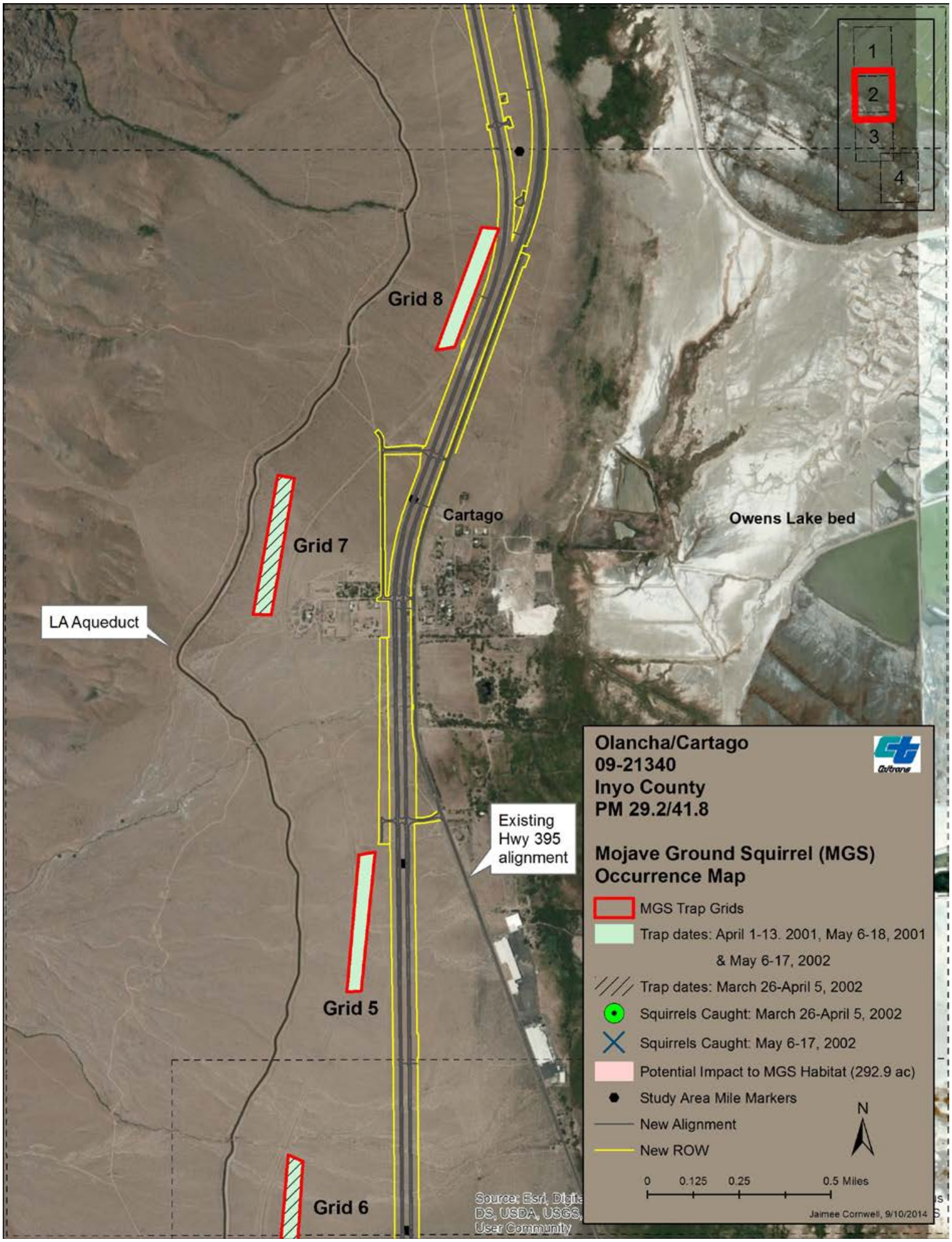
4.3.21.1. SURVEY RESULTS

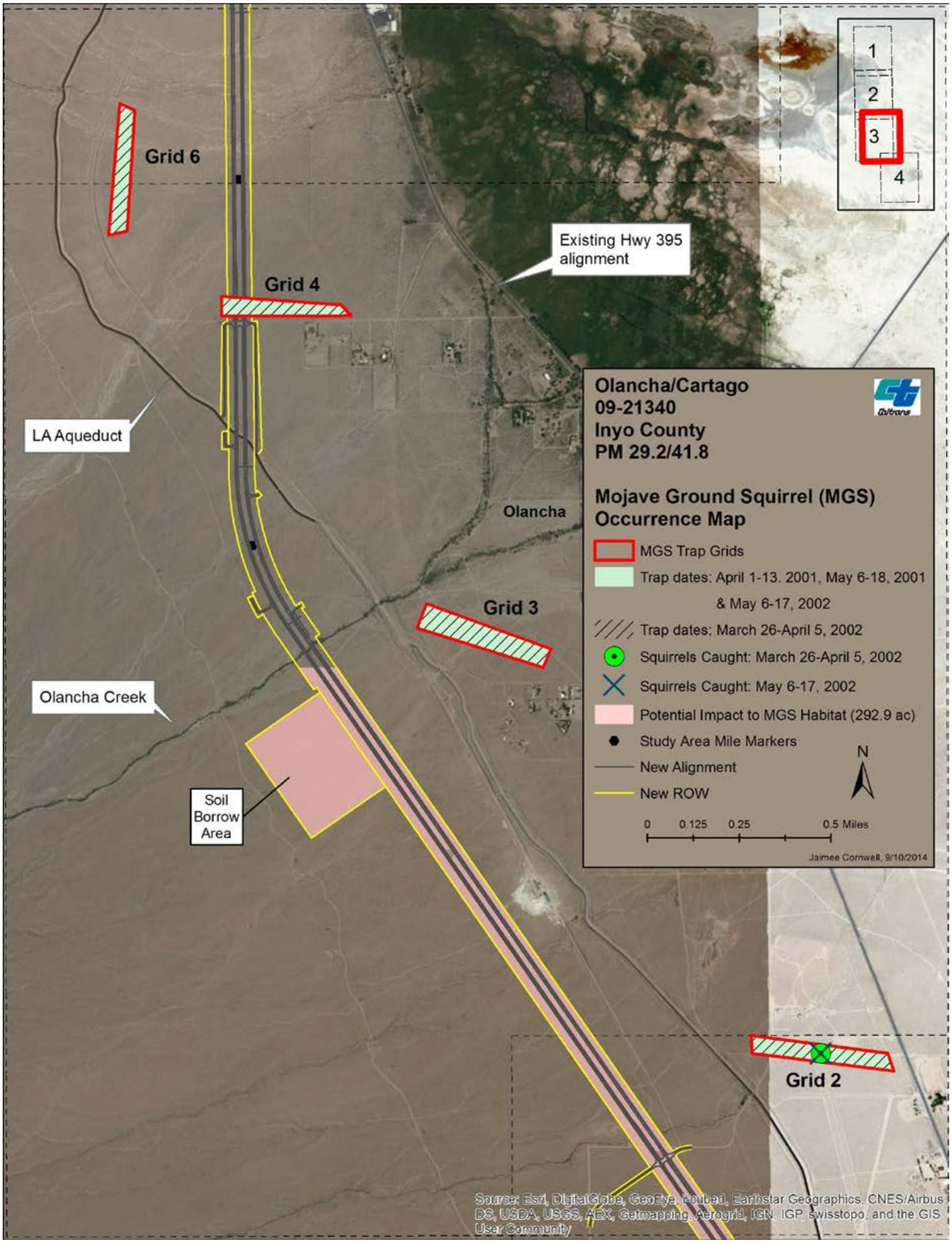
The 2001 surveys resulted in apparent absence of Mohave ground squirrels after negative trapping results throughout the sampled portions of the study area; however, in 2002 after consultations with the CDFW, trapping grids were extended further to locate the closest Mohave ground squirrel population. Mohave ground squirrels were trapped in Grids 1, 2, 13 and 14, all located south of Olancha Creek in the southern portion of the project site (Figure 16).

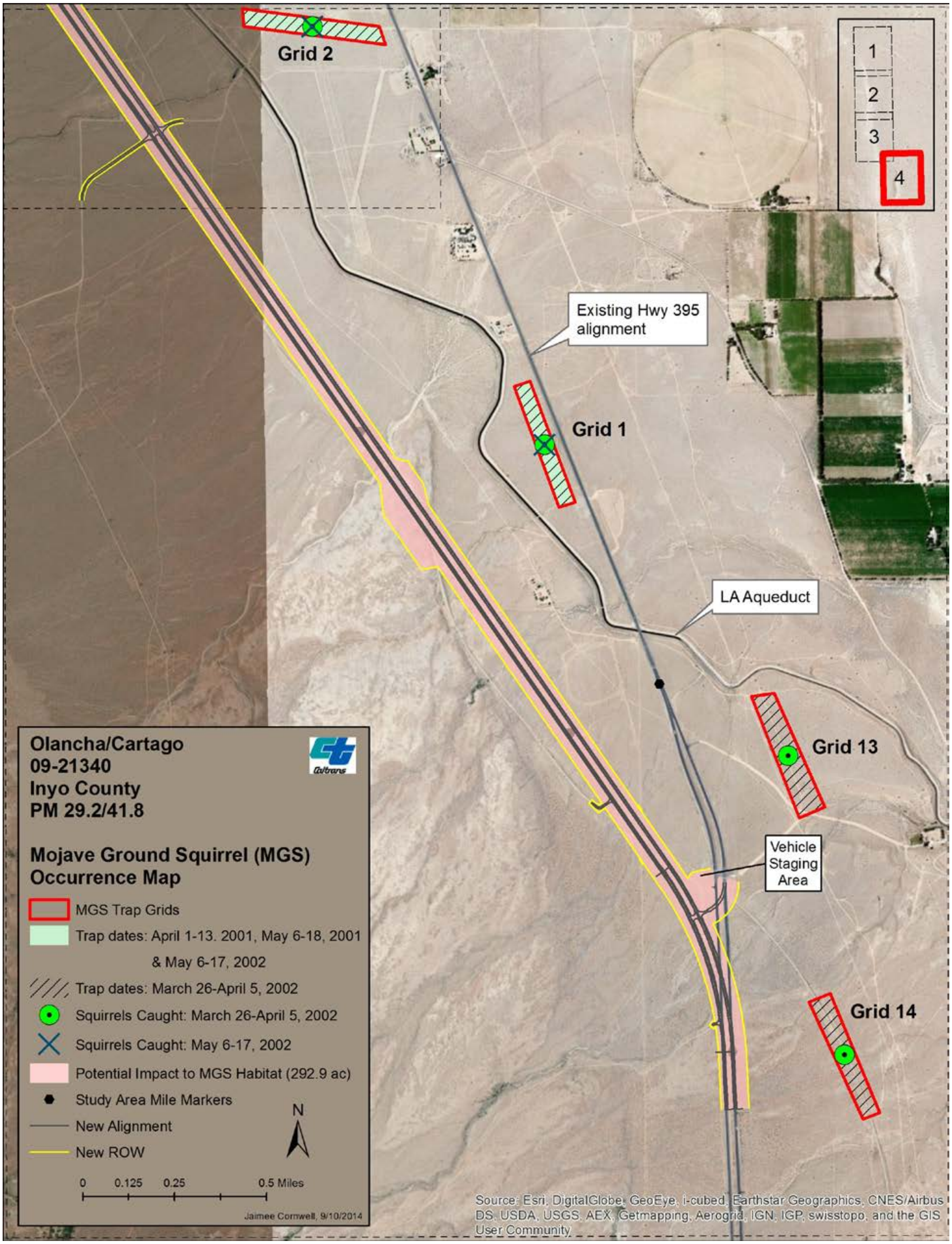
All ground squirrels that were captured were identified to species. When captured, Mohave ground squirrels and white-tailed antelope squirrels (*Ammospermophilus leucurus*) were marked on the abdomen with a red marking pen when possible, so the total number of individuals captured could be identified. They were examined for sex, age, and reproductive condition and then released at the point of capture.

Figure 16: Mohave Ground Squirrel Occurrence Map




1
2
3
4
Grid 8
Cartago
Owens Lake bed
Grid 7
LA Aqueduct
Olancha/Cartago
09-21340
Inyo County
PM 29.2/41.8
Existing
Hwy 395
alignment
Mojave Ground Squirrel (MGS)
Occurrence Map
MGS Trap Grids
Trap dates: April 1-13. 2001, May 6-18, 2001 & May 6-17, 2002
Trap dates: March 26-April 5, 2002
Squirrels Caught: March 26-April 5, 2002
Squirrels Caught: May 6-17, 2002
Potential Impact to MGS Habitat (292.9 ac)
Study Area Mile Markers
New Alignment
New ROW
N
0 0.125 0.25 0.5 Miles
Grid 5
Grid 6
Jaimee Cornwell, 9/10/2014


Grid 6
Grid 4
Existing Hwy 395 alignment
LA Aqueduct
Olancha
Grid 3
Olancha Creek
Soil Borrow Area
Grid 2
1
2
3
4
Olancha/Cartago
09-21340
Inyo County
PM 29.2/41.8
Mojave Ground Squirrel (MGS) Occurrence Map
MGS Trap Grids
Trap dates: April 1-13. 2001, May 6-18, 2001 & May 6-17, 2002
Trap dates: March 26-April 5, 2002
Squirrels Caught: March 26-April 5, 2002
Squirrels Caught: May 6-17, 2002
Potential Impact to MGS Habitat (292.9 ac)
Study Area Mile Markers
New Alignment
New ROW
N
0 0.125 0.25 0.5 Miles
Jaimee Cornwell, 9/10/2014
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


Grid 2
1
2
3
4
Existing Hwy 395 alignment
Grid 1
LA Aqueduct
Grid 13
Vehicle Staging Area
Grid 14
Olancha/Cartago
09-21340
Inyo County
PM 29.2/41.8
Mojave Ground Squirrel (MGS) Occurrence Map
MGS Trap Grids
Trap dates: April 1-13. 2001, May 6-18, 2001 & May 6-17, 2002
Trap dates: March 26-April 5, 2002
Squirrels Caught: March 26-April 5, 2002
Squirrels Caught: May 6-17, 2002
Potential Impact to MGS Habitat (292.9 ac)
Study Area Mile Markers
New Alignment
New ROW
N
0 0.125 0.25 0.5 Miles
Jaimee Cornwell, 9/10/2014
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

4.3.21.2. Avoidance and Minimization Measures

In areas where the Mohave ground squirrel was detected, pre-construction trapping efforts will be completed to relocate them outside of the project site prior to the start of construction. Exclusionary fencing will be installed so all animals caught in traps can be placed on the other side of the exclusion fence to keep this species and others caught from re-entering the project site.

An environmental awareness program will provided to all workers on the related personnel will be informed about the need to minimize impacts to only those which have been approved according to the requirements in the Incidental Take Permit (ITP) as issued by the CDFW for the projects effects on the Mohave ground squirrel.

Measures will be contained within the contract special provisions that require work to be stopped in the event a squirrel is located within the project site or becomes injured as a result of the construction activities. Work will not resume until an authorized biologist has relocated the squirrel or allowed it to disperse on its own.

4.3.21.3. Project Impacts

Approximately 292.9 acres of direct impacts to Mohave ground squirrel habitat will result from the constructed project. There is also a potential for construction related injury or mortality to individual squirrels.

4.3.21.4. Compensatory Mitigation

Compensatory mitigation proposed for the 651.28 acres of impact to on-site desert tortoise habitat will also benefit the Mohave ground squirrel.

4.3.22. Discussion of Mule Deer

Although not specifically listed by the USFWS or CDFW, the mule deer (*Odocoileus hemionus*) is known to use the habitat within the project site. The mule deer is the largest of the *Odocoileus* genus, standing, on the average, 40 to 42 inches at the shoulders and stretching approximately 80 inches from nose to tail. Adult bucks weigh between 150 and 300 pounds and adult does average between 100 and 175 pounds.

There are six recognized subspecies of mule deer in California, occurring in about half of the state. The mule deer that occur within the project site are referred to as the Monache Herd and are the Inyo subspecies of mule deer (*Odocoileus hemionus inyoensis*). The selected 4-3 Hybrid extends through a portion of wintering range habitat that is used by the Monache herd, and is vital for the success of their yearly migrations. The project extends through the portion of the Monache Herds range that is referred to as unit "Zone X-10," based on CDFW's hunting zone classifications. Fewer hunting tags are issued for Zone X-10 each year, so the bucks in this portion of the herd are larger and sometimes even described as "trophy quality" deer.

4.3.22.1. Survey Results

No surveys were conducted for the Monache Herd of mule deer; however, this species range is known to occur within the project site. Ten-year vehicle collision data, covering an approximate 50-mile stretch of highway including the existing stretch of highway located between PM 29.2 and 41.8, was reviewed. The closest deer collision to the north was approximately 14 miles from the project site, at the southern end of Lone Pine and the closest collision to the south was approximately 20 miles from the project site, near Little Lake.

4.3.22.2. Avoidance and Minimization Measures

Caltrans had proposed a large multi-use wildlife and livestock undercrossing just south of Olancha Creek, which in part was planned to allow for deer movement. However, based on the collision data, no avoidance and minimization measures are being proposed.

4.3.22.3. Project Impacts

No impacts to the Monache deer herd are expected to result from the proposed project.

4.3.22.4. Compensatory Mitigation

No compensatory mitigation is proposed.

4.3.23. Cumulative Impacts

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions combined with the impacts of the Olancha/Cartago Four-lane Project. A cumulative effects assessment looks collectively at the impacts posed by individual land use projects. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination by pesticides and herbicides, erosion, sedimentation, disruption of migration corridors, changes in water quality and introduction or promotion of predators.

The most significant cumulative impact that will occur as a result of the proposed project is the introduction of traffic to a currently undeveloped portion of land, located west of the existing alignment. Presently, lands located west of the existing alignment remain relatively undeveloped with the exception of a few scattered rural residences, the Aqueduct, the Union Pacific Railroad, a power transmission line, an existing processing plant that is no longer in use and existing residential developments located immediately west of Cartago. Because Caltrans is planning to install permanent desert tortoise exclusionary fencing, approximately 13 undercrossings and tortoise friendly cattle guards along the new alignment. One of the 13 undercrossings will be increased in size to accommodate larger species of wildlife and cattle; therefore, it is anticipated that due to the installation of the permanent tortoise fencing, tortoise friendly cattle guards, tortoise and other wildlife undercrossings, as well as the installation of RoW fencing, that cumulative effects to the species of mammals residing in the area have been avoided and/or significantly mitigated. For example, the installation of the described permanent on-site avoidance measures will prevent the isolation of individuals located on one side of the alignment from those located on the other side.

The Haiwee Clear Recovery Zone project is another proposed Caltrans project, also located on Hwy 395 (PM 20.3 north to PM 22.3) and approximately 6.9 miles south of the Olancha/Cartago project site. The Haiwee Clear Recovery Zone project will provide an additional 5 feet of paved shoulder and an additional 30 feet of unpaved, but cleared and graded ground, for the purpose of vehicle recovery for drivers who accidentally leave the roadway. The recovery zone will be constructed on both the shoulder- and median-side of the southbound lanes. Approximately 18.37 acres of undeveloped ground will be permanently impacted by construction of this project, which includes approximately 14.78 acres of impacts to the federally-threatened desert tortoise. Cumulative impacts resulting from both the Haiwee and Olancha/Cartago projects would result in a total reduction of 441.84 acres of desert tortoise habitat within the project site and its vicinity. In addition, impacts of varying acreages, will impact other species of wildlife that also use habitat within the project site, as have been described above.

Crystal Geyser, a water bottling company, is proposing to develop approximately 35 acres to construct a new bottling facility and warehouse. The proposed site would be located on a portion of the Cabin Bar Ranch property, south of Cartago. Although habitat impacts will result from the construction of the plant, more significant impacts could result from daily ground-water pumping, which would occur from three existing ground water wells in the shallow aquifer. It has been proposed that the new facility could extract up to 360-acre feet of water per year. Cumulative impacts from continuous ground water pumping is likely to impact the habitat available for species of wildlife that currently use the project site and areas in its larger vicinity. Furthermore, the ground-water pumping could further degrade the potential habitat that is currently available for the federally-endangered southwestern willow flycatcher, at a scale extending beyond the project limits. Likewise, potential habitat for the federally-endangered least Bell's vireo would also be affected if the existing population were to expand northward into the Owens Valley as a result of conservation measures being implemented in Southern California.

Routine Caltrans maintenances activities will continue on the constructed Olancha/Cartago site, but these activities should have little to no cumulative impact on wildlife or their habitat because maintenance activities will be restricted to previously disturbed areas located within the Caltrans RoW.

Chapter 5. Results: Permits and Technical Studies for Special Laws or Conditions

Appendix D provides a detailed list of the federal and state environmental laws and regulations, executive orders and applicable memoranda of understanding related to Caltrans projects.

The following permits and provisions will be adhered to before and/or during construction of the proposed project.

5.1. Federal Endangered Species Act Consultation Summary

An official request to initiate formal consultation for the federally- and state-threatened desert tortoise and the potential presence of the federally- and state-endangered southwestern willow flycatcher, was submitted by the FHWA to the USFWS in June, 2013. These are the only two federally listed species that have been determined to occur within the proposed project site. Therefore, FHWA will receive a Biological Opinion from the USFWS and follow the requirements listed therein for these two species with respect to the proposed project.

5.2. California Endangered Species Act Consultation Summary

The following state-listed species have been determined to occur, or have the potential to occur, within the proposed project site: desert tortoise (federally- and state-threatened), southwestern willow flycatcher (federally- and state-endangered), and the Mohave ground squirrel (state-threatened). Caltrans will consult with CDFW under the California Endangered Species Act to obtain incidental take permits for the desert tortoise and Mohave ground squirrel and will follow the requirements listed therein.

Although habitat potential is present within the project site for the following additional state-listed species: Mohave tar plant (state-endangered and CNPS 1B.3), Swainson’s hawk (state-threatened) and southwestern willow flycatcher (state-endangered) based on field surveys, a thorough review of scientific literature and coordination with agency staff and/or professionals with a demonstrated scientific knowledge of the species, Caltrans has determined they are not likely to occur in the BSA and that no take is anticipated. Therefore, no consultation with the CDFW under the California Endangered Species Act will be needed for these species.

5.3. Wetlands and Other Waters Coordination Summary

A wetland delineation report titled: *Jurisdictional Delineation Report for the Olancha/Cartago 4-Lane Project* was completed subsequent to the wetland and WOUS field delineations conducted from April 28 to May 6, 2009 (URS 2009). The jurisdictional delineation report was submitted to the USACE on December 3, 2009 for a verification of potential federally jurisdictional wetlands and WOUS within the project site. Please refer to this report for further discussions and details on the wetlands and WOUS within the project site.

5.4. Invasive Species

Executive Order 13112 calls for Executive Branch agencies to work to prevent the introduction and control the spread of invasive species, and eliminate or minimize their associated economic, ecological, and human health impacts (1999). To prevent the introduction and spread of invasive species, Caltrans has issued policy guidelines, which provide a framework for addressing roadside vegetation management issues for construction activities and maintenance programs. These measures may include the inspection and cleaning of construction equipment, commitments to ensure the use of invasive-free mulches, topsoils and seed mixes, as well as eradication strategies for the removal of existing populations, or those that could occur in the future. There are four invasive species present in the project site including Giant reed (*Arundo donax*), wild oats (*Avena fatua),* Italian ryegrass (*Lolium perenne),* and Russian thistle (*Salsola tragus*). Each of these species establish themselves in disturbed areas and may subsequently spread into undisturbed neighboring habitats.

None of the four species of non-native, potentially invasive plants appeared to be widespread in the study area during surveys. However, the annual species could possibly become more widespread and invasive in wetter years. Giant reed, wild oats, Italian ryegrass, and Russian thistle occurred only on the roadside along the existing lanes of Hwy 395 and were quite sparse. Aside from the Russian thistle, the other three species are relatively recent introductions because DeDecker did not list them within the Owens Valley (1974).

Caltrans will implement special provisions in the construction contract to prevent the further spread of invasive species in the project area.

5.5. Other

The 4-3 Hybrid has incorporated at least one multi-modal crossing, which will allow utilization by recreationists and cattle.

5.6. Standard Special Provisions

5.6.1. Migratory Bird Protection

The proposed project will include the removal of surface vegetation, shrubs and trees that provide potential nesting habitat for migratory birds protected by the Migratory Bird Treaty Act of 1918. Section 14 special provisions for bird protection will be included in the construction contract and will include the following avoidance and minimization measures:

Clearing and grubbing will be completed outside of the nesting season where feasible in order to avoid unnecessary impacts migratory birds;

Migratory bird clearance surveys will be completed 1 to 2 weeks prior to the start of construction if commencement occurs during the nesting season;

A mandatory environmental education will be provided for all construction personnel prior to the start of any clearing, grubbing or ground-breaking activities to review the importance of avoiding impacts to nesting migratory birds observed in the project;

Any nests discovered during the pre-construction surveys will be ESA protected along with a construction buffer to avoid impacts to young birds until they are able to fledge from the nest.

5.6.2. Bat Protection

Bats will be covered during the pre-construction clearance surveys, to be completed at the time of the migratory bird clearance surveys. If evidence of roosting bats is discovered at the time of the surveys, the appropriate bat protection measures will be incorporated prior to the onset of construction. Exclusion methods will be provided to CDFW prior to installation for approval, but some examples of methods used for bat exclusion include:

Netting, foam, or other exclusion devices can be installed to prohibit use of potential roosting habitat;

One way doors can be installed to allow roosting bats to exit but not re-enter roosting habitat;

Any exclusionary devices used will be removed between September 1 and April 15 after construction has been completed.

5.6.3. Environmentally Sensitive Areas (ESAs)

To minimize impacts to the portions of wetlands and WOUS on the project site that will not be impacted by its construction, as well as to any species of migratory nesting birds or other species of wildlife discovered in or adjacent to the project site under conditions where it is determined to be appropriate to leave them as is until they have completed rearing young, ESAs will be established. The ESAs will be demarcated with temporary orange mesh fencing and/or stakes and flagging, that will be installed prior to the start of project construction. A detailed drawing will be included in the design plans of the construction contract that delineates the placement of the selected method of demarcation to protect these resources. The ESA demarcated areas will be maintained by the contractor during construction and will be removed upon completion of the project.

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Appendix A Species Lists

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
08EVEN00-2013-SLI-0067

December 26, 2012

Jaimee Cornwell
California Department of Transportation
District 6
855 M Street, Suite 200
Fresno, California 93721

Subject: Species List for the Olancha/Cartago Four-Lane Project, Olancha, Inyo County, California

Dear Ms. Cornwell:

This letter is in response to your request received through the U.S. Fish and Wildlife Service's (Service) internet-based Information, Planning, and Conservation decision support system on November 5, 2012. You requested information on federally proposed, listed, and candidate species, and designated critical habitat that may occur in the vicinity of the subject project. The California Department of Transportation (Caltrans) is proposing a project west of the existing U.S. Highway 395 alignment from post mile 29.2 to post mile 41.8. The Federal Highway Administration has delegated authority for consultation to Caltrans; consequently, your request and our response are made pursuant to section 7(a)(2) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

The federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*) and least Bell's vireo (*Vireo bellii pusillus*) and threatened desert tortoise *(Gopherus agassizii*) may occur in the vicinity of the proposed project. No critical habitat is located in the vicinity of the proposed project.

This letter fulfills the requirements of the Service under section 7(c) of the Act, as amended. Because the Federal Highway Administration has delegated consultation authority to Caltrans for the project, Caltrans has the responsibility to review its proposed activities and determine whether any listed species may be affected. If the project is a construction project[1] which may require an environmental impact statement, Caltrans has the responsibility to prepare a biological

[1] "Construction project" means any major Federal action which significantly affects the quality of the human environment designed primarily to result in the building of structures such as dams, buildings, roads, pipelines, and channels. This includes Federal actions such as permits, grants, licenses, or other forms of Federal authorizations or approval which may result in construction.

Jaimee Cornwell 2

assessment to make a determination of the effects of the action on the listed species or critical habitat. If Caltrans determines that a listed species or critical habitat is likely to be adversely affected, it should request, in writing through our office, formal consultation pursuant to section 7 of the Act. Informal consultation may be used to exchange information and resolve conflicts with respect to threatened or endangered species or their critical habitat prior to a written request for formal consultation. During this review process, Caltrans may engage in planning efforts but may not make any irreversible commitment of resources. Such a commitment could constitute a violation of section 7(d) of the Act.

The information provided in this letter is based on the best available information, including your letter, scientific and technical literature, and information in our files. Newer information based on updated surveys, changes in the abundance and distribution of listed species, changed habitat conditions, or other factors could change this information. Please feel free to contact us if you need more current information or assistance regarding the potential presence of federally proposed, listed, or candidate species, and critical habitat.

If you have any questions, please call Erin Nordin of the Ventura Fish and Wildlife Office at (760) 872-5020.

Sincerely,

Carl T. Benz
Assistant Field Supervisor

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad is (Bartlett (3611841) or Haiwee Reservoirs (3611728) or Olancha (3611831) or Vermillion Canyon (3611738) or Haiwee Pass (3611821) or Lone Pine (3611851) or Owens Lake (3611748) or Upper Centennial Flat (3611727) or Cirque Peak (3611842) or Templeton Mtn. (3611832) or Monache Mountain (3611822) or Long Canyon (3611811) or Coso Junction (3611718))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Abronia alpina Ramshaw Meadows abronia	PDNYC01020	Candidate	None	G2	S2	1B.1
Active Desert Dunes Active Desert Dunes	CTT22100CA	None	None	G4	S2.2	
Alkali Seep Alkali Seep	CTT45320CA	None	None	G3	S2.1	
Anaxyrus canorus Yosemite toad	AAABB01040	Threatened	None	G2	S2	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Astragalus atratus var. mensanus Darwin Mesa milk-vetch	PDFAB0F0Z3	None	None	G4G5T1	S1	1B.1
Astragalus hornii var. hornii Horn's milk-vetch	PDFAB0F421	None	None	G4G5T2T3	S1	1B.1
Astragalus lentiginosus var. kernensis Kern Plateau milk-vetch	PDFAB0FB98	None	None	G5T2T3	S2S3	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Batrachoseps robustus Kern Plateau salamander	AAAAD02X20	None	None	G2	S2	
Boechera tularensis Tulare rockcress	PDBRA40130	None	None	G2	S2	1B.3
Botrychium ascendens upswept moonwort	PPOPH010S0	None	None	G3	S2	2B.3
Botrychium crenulatum scalloped moonwort	PPOPH010L0	None	None	G3	S2	2B.2
Botrychium lunaria common moonwort	PPOPH01080	None	None	G5	S2?	2B.3
Botrychium minganense mingan moonwort	PPOPH010R0	None	None	G4G5	S2	2B.2
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Calochortus excavatus Inyo County star-tulip	PMLIL0D0F0	None	None	G2	S2	1B.1
Calyptridium pygmaeum pygmy pussypaws	PDPOR09070	None	None	G2	S2	1B.2

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2	SSC
Charadrius montanus mountain plover	ABNNB03100	None	None	G3	S2?	SSC
Clarkia xantiana ssp. parviflora Kern Canyon clarkia	PDONA05181	None	None	G4T3	S3	4.2
Cordylanthus eremicus ssp. kernensis Kern Plateau bird's-beak	PDSCR0J043	None	None	G3?T2	S2	1B.3
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	Candidate Threatened	G3G4	S2S3	SSC
Cryptantha circumscissa var. rosulata rosette cushion cryptantha	PDBOR0A0G3	None	None	G5T2	S2	1B.2
Cymopterus ripleyi var. saniculoides sanicle cymopterus	PDAPI0U0X1	None	None	G3G4T3Q	S1	1B.2
Cyprinodon radiosus Owens pupfish	AFCNB02090	Endangered	Endangered	G1	S1	FP
Deinandra mohavensis Mojave tarplant	PDAST4R0K0	None	Endangered	G2G3	S2S3	1B.3
Dipodomys panamintinus argusensis Argus Mountains kangaroo rat	AMAFD03091	None	None	G5T1T3	S1S3	
Dipodomys panamintinus panamintinus Panamint kangaroo rat	AMAFD03092	None	None	G5T3	S3	
Eremothera boothii ssp. boothii Booth's evening-primrose	PDONA03052	None	None	G5T4	S2	2B.3
Eriogonum mensicola Pinyon Mesa buckwheat	PDPGN084H1	None	None	G2G3	S2	1B.3
Eriogonum wrightii var. olanchense Olancha Peak buckwheat	PDPGN086D3	None	None	G5T2	S2	1B.3
Euderma maculatum spotted bat	AMACC07010	None	None	G4	S2S3	SSC
Gopherus agassizii desert tortoise	ARAAF01012	Threatened	Threatened	G3	S2	
Gulo gulo California wolverine	AMAJF03010	None	Threatened	G4	S1	FP
Hackelia sharsmithii Sharsmith's stickseed	PDBOR0G0Q0	None	None	G2G3	S2S3	2B.3
Icteria virens yellow-breasted chat	ABPBX24010	None	None	G5	S3	SSC
Ivesia campestris field ivesia	PDROS0X050	None	None	G3	S3	1B.2
Ixobrychus exilis least bittern	ABNGA02010	None	None	G5	S1	SSC

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Lanius ludovicianus loggerhead shrike	ABPBR01030	None	None	G4	S4	SSC
Lasionycteris noctivagans silver-haired bat	AMACC02010	None	None	G5	S3S4	
Lupinus padre-crowleyi Father Crowley's lupine	PDFAB2B2Z0	None	Rare	G2	S2	1B.2
Margaritifera falcata western pearlshell	IMBIV27020	None	None	G4G5	S1S2	
Martes caurina sierrae Sierra marten	AMAJF01014	None	None	G5T3	S3	
Mentzelia tridentata creamy blazing star	PDLOA031U0	None	None	G3	S3	1B.3
Microtus californicus vallicola Owens Valley vole	AMAFF11033	None	None	G5T3	S3	SSC
Minuartia stricta bog sandwort	PDCAR0G0U0	None	None	G5	S2	2B.3
Monardella beneolens sweet-smelling monardella	PDLAM180U0	None	None	G1	S1	1B.3
Myotis volans long-legged myotis	AMACC01110	None	None	G5	S4?	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4?	
Ochotona princeps schisticeps gray-headed pika	AMAEA0102H	None	None	G5T2T4	S2S4	
Oncorhynchus mykiss aguabonita Volcano Creek golden trout	AFCHA0209A	None	None	G5T1	S1	SSC
Oryctes nevadensis Nevada oryctes	PDSOL0Q010	None	None	G2G3	S2	2B.1
Ovis canadensis sierrae Sierra Nevada bighorn sheep	AMALE04015	Endangered	Endangered	G4T1	S1	FP
Pekania pennanti fisher - West Coast DPS	AMAJF01021	Candidate	Candidate Threatened	G5T2T3Q	S2S3	SSC
Phacelia inyoensis Inyo phacelia	PDHYD0C2F0	None	None	G2	S2	1B.2
Phacelia nashiana Charlotte's phacelia	PDHYD0C350	None	None	G3	S3	1B.2
Plagiobothrys parishii Parish's popcornflower	PDBOR0V0U0	None	None	G1	S1	1B.1
Plebulina emigdionis San Emigdio blue butterfly	IILEPG7010	None	None	G1G2	S1S2	
Poa lettermanii Letterman's blue grass	PMPOA4Z1H0	None	None	G4	S3	2B.3

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Pohlia tundrae tundra thread moss	NBMUS5S1B0	None	None	G2G3	S2S3	2B.3
Pyrgulopsis wongi Wong's springsnail	IMGASJ0360	None	None	G2	S2	
Rana muscosa southern mountain yellow-legged frog	AAABH01330	Endangered	Endangered	G1	S1	SSC
Rana sierrae Sierra Nevada yellow-legged frog	AAABH01340	Endangered	Threatened	G1	S1	SSC
Sarcobatus baileyi Bailey's greasewood	PDCHE0L020	None	None	G4	S1	2B.3
Sceloporus graciosus graciosus northern sagebrush lizard	ARACF14032	None	None	G5T5	S3	
Sidalcea covillei Owens Valley checkerbloom	PDMAL11040	None	Endangered	G2	S2	1B.1
Sidalcea multifida cut-leaf checkerbloom	PDMAL110G0	None	None	G3	S2	2B.3
Siphateles bicolor snyderi Owens tui chub	AFCJB1303J	Endangered	Endangered	G4T1	S1	
Taxidea taxus American badger	AMAJF04010	None	None	G5	S4	SSC
Toxostoma lecontei Le Conte's thrasher	ABPBK06100	None	None	G4	S3	SSC
Trifolium dedeckerae Dedecker's clover	PDFAB400Q0	None	None	G2	S2	1B.3
Triglochin palustris marsh arrow-grass	PMJCG02040	None	None	G5	S3	2B.3
Viola pinetorum var. grisea grey-leaved violet	PDVIO04431	None	None	G4G5T3?	S3?	1B.3
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	
Vulpes vulpes necator Sierra Nevada red fox	AMAJA03012	None	Threatened	G5T1T2	S1	
Xerospermophilus mohavensis Mohave ground squirrel	AMAFB05150	None	Threatened	G2G3	S2S3	

Record Count: 78

CNPS Inventory of Rare and Endangered Plants

Status: Plant Press Manager window with 38 items - Thu, Oct. 17, 2013 19:11 ET c

- During each visit, we provide you with an empty "Plant Press" for collecting items of interest.
- Several report formats are available. Use the CSV and XML options to download raw data.

Reformat list as: Standard List - with Plant Press controls

DELETE unchecked items | check all | check none

open	save	scientific	common	family	CNPS
	☑	Abronia alpina	Ramshaw Meadows abronia	Nyctaginaceae	List 1B.1
	☑	Arabis repanda var. greenei	Greene's rockcress	Brassicaceae	List 3.3
	☑	Astragalus atratus var. mensanus	Darwin Mesa milk-vetch	Fabaceae	List 1B.1
	☑	Astragalus lentiginosus var. kernensis	Kern Plateau milk-vetch	Fabaceae	List 1B.2
	☑	Boechera tularensis	Tulare rockcress	Brassicaceae	List 1B.3
	☑	Botrychium ascendens	upswept moonwort	Ophioglossaceae	List 2B.3
	☑	Botrychium crenulatum	scalloped moonwort	Ophioglossaceae	List 2B.2
	☑	Botrychium lineare	slender moonwort	Ophioglossaceae	List 1B.3
	☑	Botrychium lunaria	common moonwort	Ophioglossaceae	List 2B.3
	☑	Botrychium minganense	Mingan moonwort	Ophioglossaceae	List 2B.2
	☑	Calochortus excavatus	Inyo County star-tulip	Liliaceae	List 1B.1
	☑	Calyptridium pygmaeum	pygmy pussypaws	Montiaceae	List 1B.2
	☑	Cordylanthus eremicus ssp. kernensis	Kern Plateau bird's-beak	Orobanchaceae	List 1B.3
	☑	Cryptantha circumscissa var. rosulata	rosette cushion cryptantha	Boraginaceae	List 1B.2
	☑	Cymopterus ripleyi var. saniculoides	sanicle cymopterus	Apiaceae	List 1B.2
	☑	Deinandra mohavensis	Mojave tarplant	Asteraceae	List 1B.3
	☑	Eremothera boothii ssp. boothii	Booth's evening-primrose	Onagraceae	List 2B.3
	☑	Erigeron multiceps	Kern River daisy	Asteraceae	List 1B.2
	☑	Eriogonum wrightii var. olanchense	Olancha Peak buckwheat	Polygonaceae	List 1B.3
	☑	Erythranthe calcicola	limestone monkeyflower	Phrymaceae	List 1B.3
	☑	Hackelia sharsmithii	Sharsmith's stickseed	Boraginaceae	List 2B.3

	☑	**Horkelia tularensis**	Kern Plateau horkelia	Rosaceae	List 1B.3
	☑	**Ivesia campestris**	field ivesia	Rosaceae	List 1B.2
	☑	**Lupinus padre-crowleyi**	Father Crowley's lupine	Fabaceae	List 1B.2
	☑	**Mentzelia tridentata**	creamy blazing star	Loasaceae	List 1B.3
	☑	**Minuartia stricta**	bog sandwort	Caryophyllaceae	List 2B.3
	☑	**Monardella beneolens**	sweet-smelling monardella	Lamiaceae	List 1B.3
	☑	**Oryctes nevadensis**	Nevada oryctes	Solanaceae	List 2B.1
	☑	**Phacelia inyoensis**	Inyo phacelia	Boraginaceae	List 1B.2
	☑	**Phacelia nashiana**	Charlotte's phacelia	Boraginaceae	List 1B.2
	☑	**Plagiobothrys parishii**	Parish's popcorn-flower	Boraginaceae	List 1B.1
	☑	**Poa lettermanii**	Letterman's blue grass	Poaceae	List 2B.3
	☑	**Pohlia tundrae**	tundra thread moss	Bryaceae	List 2B.3
	☑	**Sarcobatus baileyi**	Bailey's greasewood	Sarcobataceae	List 2B.3
	☑	**Sidalcea covillei**	Owens Valley checkerbloom	Malvaceae	List 1B.1
	☑	**Sidalcea multifida**	cut-leaf checkerbloom	Malvaceae	List 2B.3
	☑	**Trifolium dedeckerae**	DeDecker's clover	Fabaceae	List 1B.3
	☑	**Viola pinetorum var. grisea**	grey-leaved violet	Violaceae	List 1B.3

DELETE unchecked items | check all | check none

Appendix B   Botanical Species Compendium

Scientific Name	Common Name
Vascular Plants nomenclature follows " The Jepson Manual" and http://ucjeps.berkeley.edu/interchange.html	
GYMNOSPERMS	
EPHEDRACEAE	**EPHEDRA FAMILY**
Ephedra nevadensis	Nevada mormon's tea
Ephedra viridis	Green ephedra
ANGIOSPERMS	
DICOTYLEDONS	
AMARANTHACEAE	**AMARANTH FAMILY**
Amaranthus blitoides	Pigweed
APIACEAE	**CARROT FAMILY**
Berula erecta	Cutleaf water parsnip
Lomatium mohavense	Lomatium
ASCLEPIACEAE	**MILKWEED FAMILY**
Asclepias fascicularis	Narrow-leaf milkweed
ASTERACEAE	**SUNFLOWER FAMILY**
Acamptopappus sphaerocephalus var. hirtellus	Goldenhead
Ambrosia acanthicarpa	Annual bursage
Ambrosia dumosa	Burro-weed
Anisocoma acaulis	Anisocoma
Artemisia dracunculus	Tarragon
Artemisia ludoviciana ssp. incompta	Silver wormwood
Artemisia spinescens	Budsage
Artemisia tridentata	Big sagebrush
Baccharis salicifolia	Mulefat
Bebbia juncea	Chuckwalla sweetbush
Chaenactis stevioides	Desert pincushion
Chaenactis xantiana	Pincushion
Chrysothamnus nauseosus	Rubber rabbitbrush
Chrysothamnus teretifolius	Rabbitbrush
Chrysothamnus viscidiflorus	Yellow rabbitbrush
Coreopsis bigelovii	Tickseed

Scientific Name	Common Name
Encelia actoni	Acton's brittlebush
Encelia farinosa	Goldenhill brittlebush
Encelia virginensis	Encelia
Ericameria cooperi	Goldenbush
Ericameria cuneata var. *spathulata*	Cut leaf goldenbush
Ericameria linearifolia	Interior goldenbush
Ericameria teretifolius	Green rabbitbrush
Erigeron concinnus	Tidy fleabane
Eriophyllum pringlei	Pringle wooly daisy
Eriophyllum wallacei	Wallace’s wooly daisy
Gnaphalium luteo-album	Cudweed
Hymenoclea salsola	Cheesebush
*Lactuca serriola**	Wire lettuce*
Layia glandulosa	White layia
Malacothrix glabrata	Desert dandelion
Monoptilon bellioides	Desert star
Psilotrophe cooperi	Paper-daisy
Rafinesquia neomexicana	Desert chicory
Rafinesquia californica	California chicory
Solidago confinis	Southern goldenrod
*Taraxacum officinale**	Common dandelion*
Tetradymia axillaris	Cotton-thorn
Tetradymia stenolepis	Cotton-thorn
Trixis californica var. *californica*	California trixis
Xanthium strumarium	Cocklebur
Xylorhiza tortifolia var. tortifolia	Mojave-aster
Uropappus lindleyi	Silver puffs
BETULACEAE	**BIRCH FAMILY**
Betula occidentalis	Water birch
BORAGINACEAE	**BORAGE FAMILY**
Amsinckia tessellata ssp. *gloriosa*	Devil’s lettuce
Cryptantha barbigera	Cryptantha
Cryptantha intermedia	Cryptantha
Cryptantha micrantha	Cryptantha

Scientific Name	Common Name
Cryptantha pterocarya	Cryptantha
Pectocarya penicillata	Pectocarya
Plagiobothrys arizonicus x cansescens	Popcornflower
Tiquilia nuttallii	Tiquilia
BRASSICACEAE	**MUSTARD FAMILY**
Arabis glaucovalvula	Rock cress
*Brassica nigra**	Black mustard*
Descurainia pinnata ssp. glabra	Tansy mustard
*Hirschfeldia incana**(M)	Hoary mustard*
Lepidium flavum var. flavum	Peppergrass
Lepidium fremontii	Peppergrass
Lepidium virginicum var. *pubescens*	Virginia pepperweed
Sisymbrium altissimum	Tumble mustard
Stanleya pinnata	Prince's plume
Thysanocarpus curvipes	Lacepod
CACTACEAE	**CACTUS FAMILY**
Opuntia basilaris var. *basilaris*	Beavertail cactus
Opuntia echinocarpa	Golden cholla
CAPPARACEAE	**CAPER FAMILY**
Cleomella plocasperma	Twisted cleomella
CHENOPODIACEAE	**GOOSEFOOT FAMILY**
Atriplex argentea var. argentea	Silverscale
Atriplex canescens ssp. canescens	Four-wing saltbush
Atriplex confertifolia	Saltbush
Atriplex hymenelytra	Hollyleaf saltbush
Atriplex phyllostegia	Arrowscale
Atriplex polycarpa	Saltbush
Atriplex spinifera	Mohave saltbush
*Bassia hyssopifolia**(L)	Fivehook bassia*
*Chenopodium album**	Pigweed*
Chenopodium berlandieri	Pitseed goosefoot
Chenopodium californicum	California pigweed
Grayia spinosa	Spiny hopsage
Krascheninnikovia lanata	Winter fat

Scientific Name	Common Name
*Salsola tragus**(CW)	Russian thistle*(CW)
Sarcobatus vermiculatus	Greasewood
COVOLVULACEAE	**BINDWEED FAMILY**
Cressa truxillensis	Aalkali weed
CUSCUTACEAE	**DODDER FAMILY**
Cuscuta californica var. californica	Dodder
CYPERACEAE	**SEDGE FAMILY**
Scirpus americanus	American tule
DATISCACEAE	**DATISCA**
Datisca glomerata	Durango root
EUPHORBIACEAE	**SPURGE FAMILY**
Chamaesyce albomarginata	Rattlesnake weed
FABACEAE	**PEA FAMILY**
Astragalus layneae	Layne’s locoweed
Astragalus lentiginosus var. fremontii	Freckled milkvetch
Astragalus mohavensis	Mojave milkvetch
Astragalus whitneyi	Whitney's locoweed
Lotus corniculatus *	Bird'sfoot trefoil*
Lupinus concinnus	Bajada lupine
Lupinus excubitus	Grape soda lupine
Lupinus excubitus var. *excubitus*	Grape soda lupine
Lupinus odoratus	Mojave lupine
*Melilotus alba**	White sweetclover*
Melilotus officinalis *	Sweetclover*
Psorothamnus fremontii	Fremont's indigobush
Psorothamnus arborescens var. minutifolius	Psorothamnus
*Robina pseudoacaacia**	Black locust*
*Trifolium repens**	White head clover*
Trifolium wormskioldii	Cows clover
GENTIANACEAE	**GENTIAN FAMILY**
Centaurium venustum	Canchalagua
GERANIACEAE	**GERANIUM FAMILY**
Erodium cicutarium *	Red-stemmed filaree*
*Erodium botrys**	Filaree*

Scientific Name	Common Name
HYDROPHYLACEAE	**WATERLEAF FAMILY**
Amsinckia tessellata var. *gloriosa*	Devil's lettuce
Nama demissum var. demissum	Purple mat
Phacelia fremontii	Fremont's caterpillarflower
Phacelia tanacetifolia	Tansy-leaf phacelia
Tricardia watsonii	Three hearts
KRAMERIACEAE	**RHATANY FAMILY**
Krameria erecta	Rima rhatany
LAMIACEAE	**MINT FAMILY**
Hyptis emoryi	Desert lavender
Salaxaria mexicana	Mexican bladdersage
Salvia columbariae	Chia
Salvia dorri	Blue sage
LOASACEAE	**LOASA FAMILY**
Menztelia albicaulis	Blazing star
Mentzelia congesta	Clustered blazing star
Salazaria mexicana	Bladder sage
MALVACEAE	**MALLOW FAMILY**
Sphaeralcea ambigua var. rugosa	Apricot mallow
NYCTAGINACEAE	**FOUR O'CLOCK FAMILY**
Abronia pogonantha	desert sand verbena
Mirabilis bigelovii var. retrorsa	Four o'clock
Mirabilis multiflora	Giant four o'clock
OLEACEAE	**ASH FAMILY**
Fraxinus velutina	Arizona ash
Menodora spinescens	Spiny desert olive
Olea rusulka	Russian olive
ONAGRACEAE	**EVENING PRIMROSE FAMILY**
Camissonia boothii ssp. desertorum	Booth's sun cup
Camissonia claviformis ssp. claviformis	Sun cup
Camissonia parvula	Tiny sun cup
Camissonia campestris	Sun cup
Oenothera californica	California evening primrose
Oenothera elata ssp. *hookeri*	Hooker's evening primrose

Scientific Name	Common Name
PAPAVERACEAE	**POPPY FAMILY**
Eschscholzia minutiflora	Eschscholzia
PHRYMACEAE	**LOPSEED FAMILY**
Mimulus guttatus	Common monkeyflower
Mimulus pilosus	Downy monkeyflower
POLEMONIACEAE	**PHLOX FAMILY**
Eriastrum eremicum	Desert woolystar
Eriastrum wilcoxi	Wilcox's woollystar
Gilia brecciarum ssp. neglecata	Gilia
Leptosiphon aureus	Golden gilia
Leptosiphon mohavense	Mojave gilia
Linanthus aureus	Linanthus
Linanthus dichotomus	Evening snow
Loeseliastrum matthewsii	Desert calico
Linanthus parryae	Parry’s gilia
POLYGONACEAE	**BUCKWHEAT FAMILY**
Centrostegia thurberi	Thurber’s spineflower
Chorizanthe brevicornu ssp. spathulata	Brittle spineflower
Eriogonum cernuum var. viminale	Nodding buckwheat
Eriogonum fasciculatum var. polifolium	California buckwheat
Eriogonum inflatum var. inflatum	Desert trumpet
Eriogonum nudilarium	Whisk broom
Eriogonum pusillum	Spurry buckwheat
Eriogonum reniforme	Kidney-leaved buckwheat
Eriogonum sp.	Buckwheat
Eriogonum umbellatum ssp. *argus*	Sulphur buckwheat
Polygonum sp.	Knotweed
*Rumex crispus**(L)	Curly dock*
PORTULACACEAE	**PURSLANE FAMILY**
Calyptridium monandrum	Pussypaws
RANUNCULACEAE	**BUTTERCUP FAMILY**
Delphinium parishii ssp. parishii	Parish’s Larkspur
Ranunculus sp.	Buttercup sp.
ROSACEAE	**ROSE FAMILY**

Scientific Name	Common Name
Prunus andersonii	Desert peach
Prunus fasciculata	Desert almond
Purshia tridentata	Antelope bush
SALICACEAE	**WILLOW FAMILY**
Populus fremontii ssp. fremontii	Fremont's cottonwood
Populus tremuloides	Quaking aspen
Salix exigua	Sandbar willow
Salix gooddingii	Goodding's black willow
Salix laevigata	Red willow
Salix lasiolepis	Arroyo willow
SAURURACEAE	**LIZARD'S TAIL FAMILY**
Anemopsis californica	Yerba mansa
SCROPHULARIACEAE	**FIGWORT FAMILY**
Castilleja angustifolia	Desert paintbrush
Castilleja exserta	Purple owl's clover
Castilleja miniata ssp. miniata	Paintbrush
Castilleja minor	Paintbrush
Keckiella breviflora	Keck's bush-penstemon
Penstemon procerus	Pincushion beardtongue
Scrophularia desertorum	Desert bee plant
Veronica americana	American brooklime
*Veronica anagallis-aquatica**	Water speedwell*
SOLANACEAE	**NIGHTSHADE FAMILY**
Datura wrightii	Jimson weed
Lycium andersonii	Anderson's thornbush
Lycium cooperi	Box-thorn
Lycium fremontii	Fremont's desert thorn
TAMARICACEAE	**TAMARISK FAMILY**
*Tamarix ramosissima**(H)	Tamarix*
ULMACEAE	**ELM FAMILY**
Ulmus sp.	Oriental Elm
URTICACEAE	**NETTLE FAMILY**
Urtica dioica ssp. *holosericea*	Stinging nettle
ZYGOPHYLLACEAE	**CALTROP FAMILY**

Scientific Name	Common Name
Fagonia laevis	California fagonbush
Larrea tridentata	Creosote bush
ANGIOSPERMS	
MONOCOTYLEDONS	
IRIDAE	**IRIS FAMILY**
Sisyrinchium bellum	Blue-eyed-grass
JUNCACEAE	**RUSH FAMILY**
Eleocharis parishii	Parish's spikerush
Eleocharis marcrostachya	Common spikerush
Juncus balticus	Baltic Rush
Juncus bufonius	Toad rush
Juncus cooperi	Cooper’s Rush
Juncus effusus	Spreading rush
Juncus mexicanus	Mexican rush
LILIACEAE	**LILY FAMILY**
Allium fimbriatum var. mohavense	Onion
Dichelostemma capitatum ssp. pauciflorum	Blue dicks
Muilla coronata	Crowned muilla
Yucca brevifolia	Joshua tree
POACEAE	**GRASS FAMILY**
Achnatherum hymenoides	Indian ricegrass
Achnatherum occidentale ssp. *californicum*	Western needlegrass
Achnatherum speciosum	Desert needlegrass
*Arundo donax**(H)	Giant reedgrass*
*Avena fatua**(M)	Wild oats*
*Bromus catharticus**	Rescue grass*
*Bromus diandrus**(M)	Ripgut brome*
*Bromus madritensis ssp. rubens**(H)	Red brome*
*Bromus tectorum**(H)	Cheat grass*
*Cynodon dactylon**(M)	Bermuda grass*
Distichlis spicata	Saltgrass
Elymus elymoides	Bottlebrush squirreltail
Elymus multisetus	Big squirreltail
Hordeum jubatum	Squirreltail barley

Scientific Name	Common Name
Hordeum murinum ssp. *glaucum**	Foxtail barley*
Leptochloa fascicularis	Sprangletop grass
*Lolium multiflorum**(M)	wild rye*
Muhlenbergia rigens	Deergrass
Poa secunda ssp. secunda	One-sided bluegrass
*Polypogon monspeliensis**(L)	Rabbit’s foot grass*
*Schismus arabicus**(L)	Mediterranean grass*
Sporobolus airoides	Open schismus
Sporobolus cryptanthus	Alkali sacaton
Vulpia microstachys var. pauciflora	Vulpia

This table includes all plants observed and reported in the 2003 NES (Caltrans), 2008 Botanical Survey Report (Morro Group of SWCA) and 2009 Jurisdictional Delineation Report for the Olancha/Cartago 4-Lane Project (URS).
* = Invasive, Non-native
(CW) = California noxious weed, Noxious Weed Inventory Database
(L) = California Invasive Plant Inventory Database; minor ecological impacts
(M) = California Invasive Plant Inventory Database; substantial and apparent ecological impacts
(H) = California Invasive Plant Inventory Database; severe ecological impacts

Appendix C   Wildlife Species Compendium

Common Name	Scientific Name	Federal Status	State Status
INSECTS			
Theraphosidae			
Tarantula	*Eurypelma californicum*		
REPTILES			
Colubridae (Snakes)			
Western shovel-nosed snake	*Chionactis occipitalis*		
Common kingsnake	*Lampropeltis getulus*		
Coachwhip	*Masticophis flagellum*		
Red Coachwhip	*Mastigophis flagellum piceus*		
Crotaphytidae (Collared Lizards)			
Collared lizard	*Crotaphytus insularis*		
Long-nosed leopard lizard	*Gambelia wislizenii*		
Iguanidae (Iguanas and related)			
Desert iguana	*Dipsosaurus dorsalis*		
Phrynosomatidae (Spiny Lizards)			
Zebra-tailed lizard	*Callisaurus draconoides*		
Desert horned lizard	*Phrynosoma platyrhinos*		
Desert spiny lizard	*Sceloporus magister*		
Western fence lizard	*Sceloporus occidentalis*		
Side-blotched lizard	*Uta stansburiana*		
Teiidae (Whiptails and Racerunners)			
Western whiptail	*Aspidoscelis tigris*		
Great basin whiptail	*Cnemidophorus tigris*		
Testudinidae (Land Tortoises)			
Desert tortoise (sign)	*Gopherus agassizii*	FT	ST
BIRDS			
Accipitridae (Hawks, Kites, Harriers, and Eagles)			
Coopers hawk	*Accipiter cooperii*		
Golden eagle	*Aquila chrysaetos*	BLMS	
Northern harrier	*Circus cyaneus*		CSC
Red-tailed hawk	*Buteo jamaicensis*		
Alaudidae (Larks)			
Horned lark	*Eremophila alpestris*		
Le conte's thrasher	*Toxostoma lecontei*		CSC
Apodidae (Swifts)			
White-throated swift	*Aeronautes saxaitalis*		
Vaux’s swift	*Chaetura vauxi*		CSC
Ardeidae (Wading Birds)			
Great blue heron	*Ardea herodias*		
Caprimulgidae (Nighthawks and Nightjars)			
Lesser nighthawk	*Chordeiles acutipennis*		
Common nighthawk	*Chordeiles minor*		
Common poorwill	*Phalaenoptilus nutallii*		

Common Name	Scientific Name	Federal Status	State Status
Cardinalidae (Cardinals)			
Western tanager	*Piranga ludoviciana*		
Summer tanager	*Piranga rubra*		CSC
Cathartidae (New World Vultures)			
Turkey vulture	*Cathartes aura*		
Certhiidae (Treecreepers)			
Brown creeper	*Certhis americana*		
Charadriidae (Plovers, Dotterels and Lapwings)			
Killdeer	*Charadrius vociferous*		
Columbidae (Pigeons and Doves)			
Mourning dove	*Zenaida macroura*		
Rock dove	*Columbia livia*		
Corvidae (Crows and Allies)			
Common raven	*Corvus corax*		
Black-billed magpie	*Pica pica*		
Cuculidae (Cuckoos and Roadrunners)			
Greater roadrunner	*Geococccyx californianus*		
Emberizidae (Sparrows and allies)			
Rufous-crowned sparrow	*Aimophila ruficeps*		
Sage sparrow	*Amphispiza belli*		
Black-throated sparrow	*Amphispiza bilineata*		
Dark-eyed junco	*Junco hyemalis*		
Lincoln’s sparrow	*Melospiza lincolnii*		
Song sparrow	*Melospiza melodia*		CSC
White crowned sparrow	*Zonotrichia leucophrys*		
Falconidae (Falcons and Crested Caracara)			
American kestrel	*Falco sparverius*		
Praire falcon	*Falco mexicanus*		
Fringillidae (Finches)			
House finch	*Carpodacus mexicanus*		
Lesser goldfinch	*Carduelis psaltria*		
Hirundinidae (Swallows and Martins)			
Cliff swallow	*Hirundo pyrrhonota*		
Barn swallow	*Hirundo rustica*		
Northern rough-winged swallow	*Stelgidopterix serripennis*		
Tree swallow	*Tachycineta bicolor*		
Violet-green swallow	*Tachycineta thalassina*		
Icteridae (Icterids)			
Red-winged blackbird	*Agelaius phoeniceus*		
Brewer's blackbird	*Euphagus cyanocephalus*		
Northern oriole	*Icterus galbula*		
Brown-headed cowbird	*Moloathrus ater*		
Great-tailed grackle	*Quiscalus mexicanus*		
Western meadowlark	*Sturnella neglecta*		
Laniidae (Shrikes)			
Loggerhead shrike	*Lanius ludovicianus*		CSC

Common Name	Scientific Name	Federal Status	State Status
Laridae (Gulls)			
California gull	*Larus californicus*		
Mimidae (Mimids)			
Northern mockingbird	*Mimus polyglottos*		
Odontophoridae (Quails)			
California quail	*Callipepla californica*		
Paridae (Tits, Chickadees, Titmice)			
Plain oak titmouse	*Baeolophus inornatus*		
Parulidae (Warblers)			
Yellow-rumped warbler	*Dendroica coronata*		
Black-throated gray warbler	*Dendroica nigrescens*		
Townsend's warbler	*Dendroica townsendi*		
Common yellowthroat	*Geothlypis trhchas*		
MacGillivray's warbler	*Oporornis tolmiei*		
Orange-crowned warbler	*Vermivora celata*		
Nashville warbler	*Vermivora ruficapilla*		
Wilson's warbler	*Wilsonia pusilla*		
Passeridae (Sparrows and allies)			
House sparrow	*Passer domesticus*		
Savannah sparrow	*Passerculus sandwichensis*		
Brewer's sparrow	*Spizella breweri*		
Chipping sparrow	*Spizella passerina*		
White-crowned sparrow	*Zonotrichia leucophrys*		
Pelecanidae (Pelecaniformes)			
American white pelican	*Pelecanus erythrorhynchos*		CSC
Picidae (Woodpeckers)			
Northern flicker	*Colaptes auratus*		
Lewis' woodpecker	*Melanerpes lewis*		
Ladderback woodpecker	*Picoides scalaris*		
Red-breasted sapsucker	*Sphyrapicus ruber*		
Polioptilidae (Gnatcatchers)			
Blue-gray gnatcatcher	*Polioptila caerulea*		
Regulidae (Kinglets)			
Ruby-crowned kinglet	*Regulus calendula*		
Scolopacidae (Sandpipers)			
Wilson's snipe	*Gallinago delicata*		
Strigidae (Owls)			
Burrowing owl	*Athene cunicularia*	BLMS	CSC
Sturnidae (Starlings)			
European starling	*Sturnus vulgaris*		
Trochilidae (Hummingbirds)			
Black-chinned hummingbird	*Archiliocus alexandri*		
Costa's hummingbird	*Calypte costae*		
Troglodytidae (Wren)			
Cactus wren	*Campylorhynchus brunneicapillus*		
Bewick's wren	*Thryomanes bewickii*		

Common Name	Scientific Name	Federal Status	State Status
House wren	*Troglodytes aedon*		
Rock wren	*Salpinctes obsoletus*		
Turdidae (Thrushes)			
Hermit thrush	*Catharus guttatus*		
Mountain bluebird	*Sailia currucoides*		
Western bluebird	*Sialia mexicana*		
American robin	*Turdus migratorius*		
Tyrannidae (Flycatchers)			
Grey flycatcher	*Empidonax wrightii*		
Dusky flycatcher	*Empidonax oberholseri*		
Ash-throated flycatcher	*Myiarchus cinerasecens*		
Black phoebe	*Sayornis nigricans*		
Say's phoebe	*Sayornis saya*		
Western kingbird	*Tyrannus verticalis*		
Vireonidae (Vireos)			
Cassin's vireo	*Vireo cassinii*		
MAMMALS			
Equidae (Horses and Asses)			
Domestic horse	*Ferus caballus*		
Bovidae (Cattle, Sheep, and Goats)			
Cow	*Bos primigenius*		
Domestic sheep	*Ovis aries*		
Canidae (Foxes, Wolves, and Coyotes)			
Coyote	*Canis latrans*		
Domestic dog	*Canis domesticus*		
Desert Kit Fox	*Vulpes macrotis arsipus*		
Sciuridae (Squirrels, Chipmunks, and Marmots)			
White-tailed antelope ground squirrel	*Ammospermophilus leucurus*		
California ground squirrel	*Spermophilus beecheyi*		
Mohave ground squirrel	*Spermophilus Mohavensis*	BLMS	ST
Heteromyidae (Kangaroo rats)			
Merriam's kangaroo rat	*Dipodomys merriami*		
Great Basin kangaroo rat	*Dipodomys microps*		
Little pocket mouse	*Perognathus longimembris*		
Cricetidae (Rats, Mice and Voles)			
Long-tailed pocket mouse	*Chaetodipus formosus*		
California vole	*Microtus californicus*		
Owen's Valley vole	*Microtus californicus vallicola*	BLMS	CSC
Dusky-footed woodrat	*Neotoma fuscipes*		
Desert wood rat	*Neotoma lepida*		
Southern grasshopper mouse	*Onychomys torridus*		
Deer mouse	*Peromyscus maniculatus*		
Pinyon mouse	*Peromyscus truei*		
Western harvest mouse	*Reithrodontomys megalotis*		
Leporidae (Rabbits and Hares)			

Common Name	Scientific Name	Federal Status	State Status
Desert cottontail	*Sylvilagus audubonii*		
Black-tailed jackrabbit	*Lepus californicus*		
Vsepertilionidae (Bats)			
Pallid bat	*Antrozous pallidus*	BLMS	CSC
Small-footed myotis	*Myotis ciliolabrum*	BLMS	
Long-eared myotis	*Myotis evotis*	BLMS	
Fringed myotis	*Myotis thysanodes*	BLMS	
Long-legged bat	*Myotis volans*		
Yuma myotis	*Myotis yumanensis*	BLMS	
Mustelidae (Weasels)			
Long-tailed weasel	*Mustela frenata*		
Geomyidae (Pocket gopher)			
Botta's pocket gopher	*Thomomys bottae*		
Mephitidae (Skunks)			
Striped skunk	*Mephitis mephitis*		

This table includes all wildlife observed and reported in the 2003 NES (Caltrans), 2008 Botanical Survey Report (Morro Group of SWCA) and 2012 Route 395 Olancha/Cartago Four-Lane Project Desert Tortoise Survey Report (ECORP Consulting).

Appendix D Environmental Laws & Regulations, Executive Orders and Applicable Memoranda of Understanding

Federal Laws and Regulations:

National Environmental Policy Act (42 U.S.C. 4321 et seq.): NEPA declares a continuing Federal policy "to use all practicable means and measures...to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations." NEPA directs "a systematic, interdisciplinary approach" to planning and decision making and requires environmental statements for "major Federal actions significantly affecting the quality of the human environment." Implementing regulations by the Council on Environmental Quality (CEQ) (40 CFR Parts 1500-1508) requires Federal agencies to identify and assess reasonable alternatives to proposed actions that will restore and enhance the quality of the human environment and avoid or minimize adverse environmental impacts. Federal agencies are further directed to emphasize significant environmental issues in project planning and to integrate impact studies required by other environmental laws and Executive Orders into the NEPA process. The NEPA process should therefore be seen as an overall framework for the environmental evaluation of Federal actions.

Endangered Species Act of 1973 (16 U.S.C. 1531-1543): This act and subsequent amendments provide guidance for the conservation of endangered and threatened species and the ecosystems upon which they depend.

Section 7 requires Federal agencies, in consultation with, and with the assistance of the Secretary of the Interior or the Secretary of Commerce, as appropriate, to insure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species. The U. S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) share responsibilities for administering the Act. Regulations governing interagency cooperation under Section 7 are found at 50 CFR Part 402. The opinion issued at the conclusion of consultation will include a statement authorizing take that may occur incidental to an otherwise legal activity.

Section 9 lists those actions that are prohibited under the Act. Take of a species listed in accordance with the Act is prohibited. There are two processes whereby take is allowed when it is incidental to an otherwise legal activity.

<u>Migratory Bird Treaty Act (16 U.S.C. 703-711)</u>: This treaty with Canada, Mexico and Japan makes it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill migratory birds. The law applies to the removal of nests (such as swallow nests on bridges) occupied by migratory birds during the breeding season.

<u>Clean Water Act (33 U.S.C. 1251-1376)</u>: The Clean Water Act (CWA) provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters.

<u>Section 401</u> requires that an applicant for a Federal license or permit that allows activities resulting in a discharge to waters of the United States, must obtain a state certification that the discharge complies with other provisions of CWA. The Regional Water Quality Boards administer the certification program in California.

<u>Section 402 establishes</u> a permitting system for the discharge of any pollutant (except dredge or fill material) in to waters of the United States.

<u>Section 404</u> establishes a permit program administered by ACOE regulating the discharge of dredged or fill material into waters of the United States (including wetlands). Implementing regulations by ACOE are found at 33 CFR Parts 320-330. Guidelines for implementation are referred to as the Section 404 (b)(1) Guidelines and were developed by the Environmental Protection Agency (EPA) in conjunction with ACOE (40 CFR Parts 230). The Guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that will have less adverse impacts.

<u>Fish and Wildlife Coordination Act (16 U.S.C. 661-666)</u>: This act applies to any Federal project where the waters of any stream or other body of water are impounded, diverted, deepened, or otherwise modified. Project proponents are required to consult with USFWS and the appropriate state wildlife agency. These agencies prepare reports and recommendations that document project effects on wildlife and identify

measures that may be adopted to prevent loss or damage to wildlife resources. The term "wildlife" includes both animals and plants. Provisions of the Act are implemented through the NEPA process and Section 404 permit process.

<u>Executive Order 11988 Floodplain Management (May 24, 1977)</u>: This order directs all Federal agencies to avoid the long-term and short-term adverse impacts associated with floodplain modification and to avoid direct or indirect support of floodplain development whenever there is a practicable alternative.

<u>Executive Order 11990 Protection of Wetlands (May 24, 1977)</u>: This order establishes a National policy to avoid adverse impacts on wetlands whenever there is a practicable alternative. The U. S. Department of Transportation (DOT) promulgated DOT Order 5660.1A in 1978 to comply with this direction. On Federally funded projects, impacts on wetlands must be identified in the environmental document. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included. This must be documented in a specific Wetlands Only Practicable Alternative Finding in the final environmental document. An additional requirement is to provide early public involvement in projects affecting wetlands. The Federal Highway Administration (FHWA) provides technical assistance in meeting these criteria (FHWA Technical Advisory 6640.8A) and reviews environmental documents for compliance.

<u>Executive Order 13112 Invasive Species February 3, 1999)</u>: This order directs all Federal agencies to prevent and control the spread of invasive plants and animals and to avoid direct or indirect impacts whenever there is a practicable alternative.

State Laws and Regulations:

<u>California Environmental Quality Act (P.R.C. 21000 et seq.)</u>: CEQA establishes State policy to prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures. CEQA applies to actions directly undertaken, financed, or permitted by State lead agencies. Regulations for implementation are found in the State CEQA Guidelines published by the Resources Agency. These guidelines establish an overall process for the environmental evaluation of projects that is similar to that promulgated under NEPA. The Guidelines make provisions for joint NEPA/CEQA documents.

<u>California Endangered Species Act (Fish and Game Code 2050 et seq.)</u>: This act establishes the policy of the State to conserve, protect, restore, and enhance threatened or endangered species and their habitats. California Endangered Species Act (CESA) mandates that State agencies should not approve projects that will jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that will avoid jeopardy. CESA requires State lead agencies to consult with the California Department of Fish and Game (CDFG) during the CEQA process to avoid jeopardy to threatened or endangered species. As an outcome of consultation, CDFG is required to issue a written finding indicating if a project will jeopardize threatened or endangered species and specifying reasonable and prudent alternatives that will avoid jeopardy. The Act provides for joint consultations when species are listed by both the State and Federal governments.

<u>Native Plant Protection Act (Fish and Game Code 1900-1913)</u>: California's Native Plant Protection Act (NPPA) requires all State agencies to utilize their authority to carry out programs to conserve endangered and rare native plants. Provisions of NPPA prohibit the taking of listed plants from the wild and require notification of the CDFG at least 10 days in advance of any change in land use. This allows CDFG to salvage listed plant species that will otherwise be destroyed. Caltrans is required to conduct botanical inventories and consult with CDFG during project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.

<u>Sections 1602-1603 of the Fish and Game Code</u>: Under these sections of the Fish and Game Code, Caltrans and other agencies are required to notify CDFG prior to any project that will divert, obstruct or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, CDFG is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications and bid documents for the project.

Agreements and Understandings:

<u>Memorandum of Understanding (MOU) with Fish and Wildlife Service (November 1988)</u>: This MOU establishes procedures for the early and continuous coordination of transportation project development activities between Caltrans and USFWS.

MOU with the Department of Fish and Game (December 1990): This MOU ensures that State transportation projects are planned, designed, constructed and maintained to protect fish and wildlife resources in conformance with CEQA and CESA.

Memorandum of Agreement (MOA) between FHWA, ACOE, EPA, USFWS, CDFG, and Caltrans (May 1991), Early Mitigation Planning for Transportation Improvements in California: This MOA establishes a process to identify and evaluate valuable natural resources and habitat at the earliest stages of transportation improvement planning. It provides a framework to implement coordinated mitigation planning at the beginning of the project development process leading to an agreement on mitigation strategy for guidance during project design.

Planning Guidelines for Standard Approaches to Mitigation Site Monitoring and Maintenance- under November 1988 MOU with Sacramento Office of USFWS (November 1991): This MOU provides planning guidelines to improve the success of project mitigation within the jurisdiction of Caltrans and USFWS.

MOU - NEPA and Clean Water Act Section 404 Integration Process (March 3, 1994): This MOU ensures the earliest possible consideration of environmental concerns pertaining to waters of the United States, including wetlands, at the transportation project planning, programming, and project development stages by integrating section 404 into the NEPA process.

Caltrans Policies:

Transportation projects are planned and constructed to avoid or minimize impacts to biological resources whenever practicable.

Caltrans evaluates and plans for mitigation of adverse impacts to natural resources during the early stages of transportation planning and decision-making.

Caltrans works closely with resources agencies and FHWA in the development and implementation of mitigation for project impacts necessary to satisfy State and Federal laws while ensuring that mitigation necessitated by impacts to sensitive resources is a reasonable expenditure of highway funds.

If impact avoidance is not possible, the first consideration is to minimize impacts on-site.

If mitigation on-site is not practical, off-site compensation may be required. Off-site mitigation may include land acquisition and habitat improvement.

Federal Highway Administration Policies:

Designation of Non-Federal Representative (50 CFR Section 402.08): Allows Federal agencies to delegate Informal Consultation and preparation of biological studies to a non-Federal representative. The Federal Highway Administration by letter to US Fish and Wildlife Service and National Marine Fisheries Service dated August 7, 1986, has previously delegated Informal Consultation for projects funded by the Federal-aid highway program to the California Department of Transportation. This delegation of authority provides for Caltrans to perform certain aspects of consultation, acting on behalf of the FHWA for Endangered Species Act consultation, and cannot be further delegated to local agencies or their consultants.

Bureau of Land Management Policies:

The following is a summary of relevant guidance from the 1993 BLM Resource Management Plan:

Area Wide Direction: Yearlong protection of endangered, threatened, candidate and sensitive plant and animal habitats. Yearlong is defined as “no discretionary actions which would adversely affect target resources would be allowed.” Existing uses and casual use would be managed to prevent disturbance which would adversely affect the target resource. Manage all activities to assure no net loss of wetlands or riparian habitats. Allow mitigation for impacts to wetlands or riparian habitats to occur outside of the resource area.

Owens Lake Management Area Direction: Manage to protect and enhance wildlife habitat. Maintain and enhance habitat for mule deer and tule elk. Yearlong protection of tule elk calving areas. Maintain and enhance habitat for Owens pupfish, Owens tui chub, western snowy plover, Owens Valley vole and Owens sand dune snout beetle. Improve trout habitat on Braley Creek, Cottonwood Creek and Cartago Creek.

Location Hydraulic Study/Floodplain Evaluation and Addendum

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: JUAN TORRES
ASSOCIATE ENVIRONMENTAL PLANNER

Date: JANUARY 31,2007

File: 09-21340K

From: ANDREW BRANDT
HYDRAULICS ENGINEER

Subject: FLOODPLAIN EVALUATION UPDATE

All previous information contained in the December 2000 Floodplain Evaluation Report & Location Hydraulics Study still applies therefore, no changes are necessary.

FLOODPLAIN EVALUATION REPORT

&

LOCATION HYDRAULICS STUDY

For Proposed Project:

09-KER-395 - PM 30.8/41.8 (KP 49.6/67.3)

"Olancha - Cartago 4-Lane"

Prepared by : Truman P. Denio, PE
Caltrans Hydraulics Engineer

CALIFORNIA DEPARTMENT OF TRANSPORTATION

DISTRICT 6
December, 2000

Floodplain Evaluation Report
& Location Hydraulics Study

For Proposed Project:

09-INY-395-PM 30.8/41.8 (KP 49.6/67.3) "Olancha – Cartago 4-Lane"

Project Description:

The proposed action on State Route 395 is to upgrade the existing two-lane conventional highway to a four lane expressway or partial four lane conventional four lane highway. The project is in Inyo County on Rte 395 through the communities of Olancha and Cartago from 0.8 km (0.5 miles) south of Los Angeles (LA) Aqueduct Bridge #48-10 to 0.8 km (0.3 miles) south of Ash Creek Bridge #48-11.

Alternatives include; 1) widening the existing two lane highway to four lanes, 2) using existing roadway as one set of lanes and constructing a new set of lanes on new alignment on west or east side of existing, 3) constructing four new lanes on new alignment, and 4) no build.

Route 395 is a major north-south highway and is located at the eastern base of the Sierra Nevada mountains.

Hydrologic / Geographic Information:

The project is located in a semi-arid region of southern Inyo County in the "rain shadow" of the Eastern side of the Sierra Nevada Mountains. The elevation at the project site is about 1120 meters (3700 ft). The tributary drainage basins at the crest extend up to 3895 meters (12,780 ft.). In the project area the average annual precipitation is 15 to 20 cm. (6 to 8 inches), occurring primarily as rainfall. The upper reaches of the tributary basins averages 50 cm (20 inches) precipitation occurring primarily as snowfall. Peak flows usually occur from snowmelt runoff; however, there can be flash flooding from intense late summer thunderstorms. A severe flash flood occurred in September of 1989 in the Olancha Creek drainage.

The cross drainage at the highway in this area is significantly affected by the LA aqueduct which is located west (upstream) and parallel to the highway. The aqueduct intercepts most normal flow including Olancha Creek, Cartago Creek and Braley Creek. Within the limits of the project seventeen overchutes convey excess flows over the aqueduct and to the east. The flows at the highway are dependent on the hydraulics of the overchutes. When the hydrology of the basins indicate flows greater than the capacity of the overchutes then the highway facility is designed for the overchute capacity. Excess flows greater than the overchutes drain into the aqueduct. The overchute capacity at Olancha Creek is 25 cms (880 cfs) and at Cartago Creek it is 17 cms (600 cfs).

The LADWP aqueduct affords some protection for the highway, especially where the highway traverses the base of the Olancha Creek and Cartago Creek alluvial fans. In late summer of 1989 a severe flood came down these fans and filled the aqueduct with mud and rocks. Although some minor flooding occurred along the shoulder, the highway was spared because of the aqueduct interception. At the north end of the project the LA aqueduct has an emergency overflow spillway weir with a capacity of 1,390 cfs.

Land Use:

The land is combination of open space and residential and commercial development in the communities of Olancha and Cartago. There is some ranchland with livestock pasture. Land adjacent to the highway is owned by private, City of Los Angeles, and federal Bureau of Land Management.

Conclusion:

There are no Federal Emergency Management Agency (FEMA) designated floodplains per the Flood Insurance Rate Maps (FIRM) for the area. The entire area is designated Zone "C" which is zone of "minimal flooding".

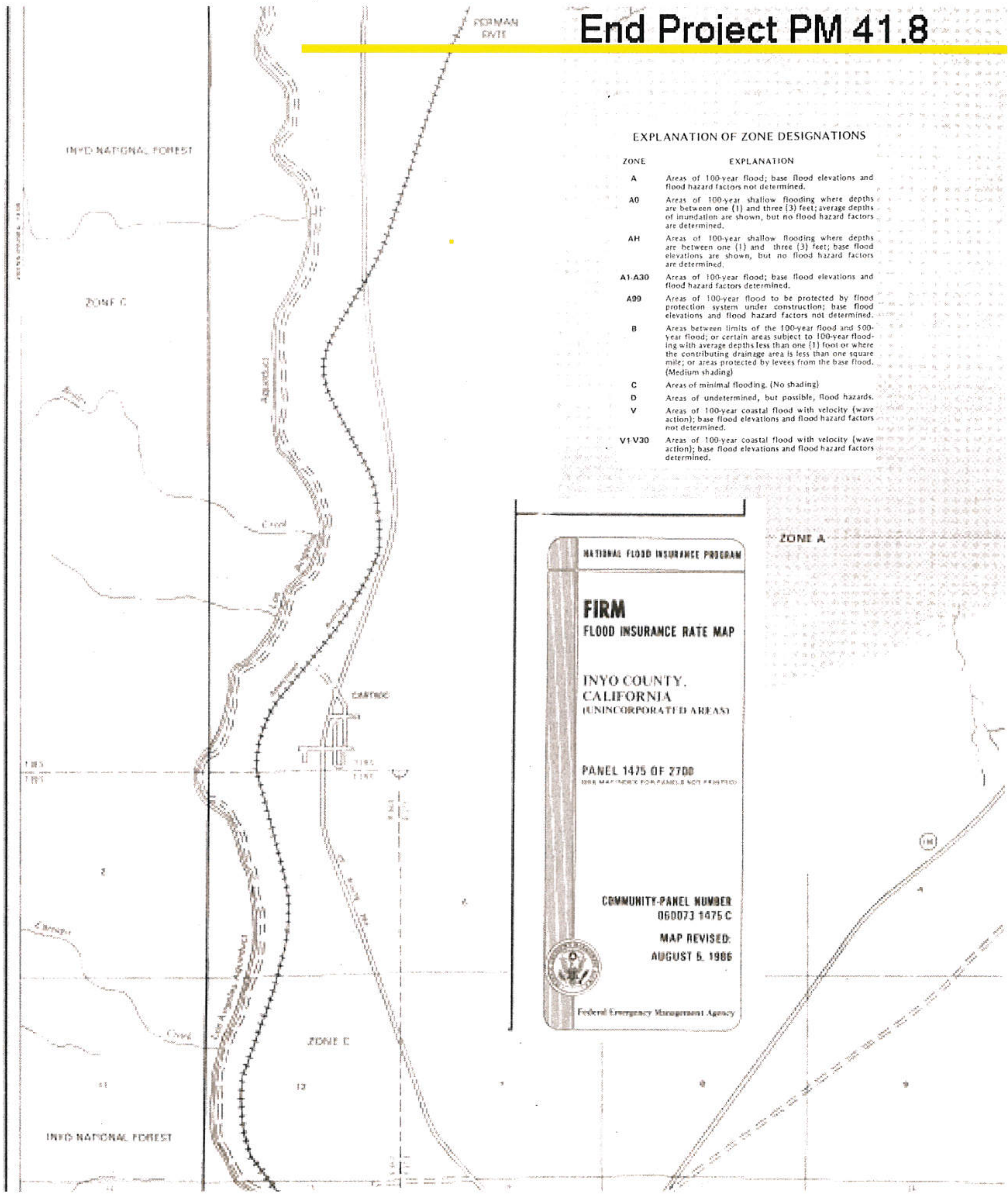
All new highway cross drainage facilities will be designed to convey the 100 year flow, considering the effects of the LADWP aqueduct interception. The spillway will be designed for the maximum flow. Where the roadbed is in fill, cross drainage will be provided to adequately convey sheet and random flows to prevent the increase of upstream water surface elevation.

The proposed action will not have the effect of significantly raising the base (100 year) floodwater surface elevations within the project and is not considered a significant encroachment on any floodplains.

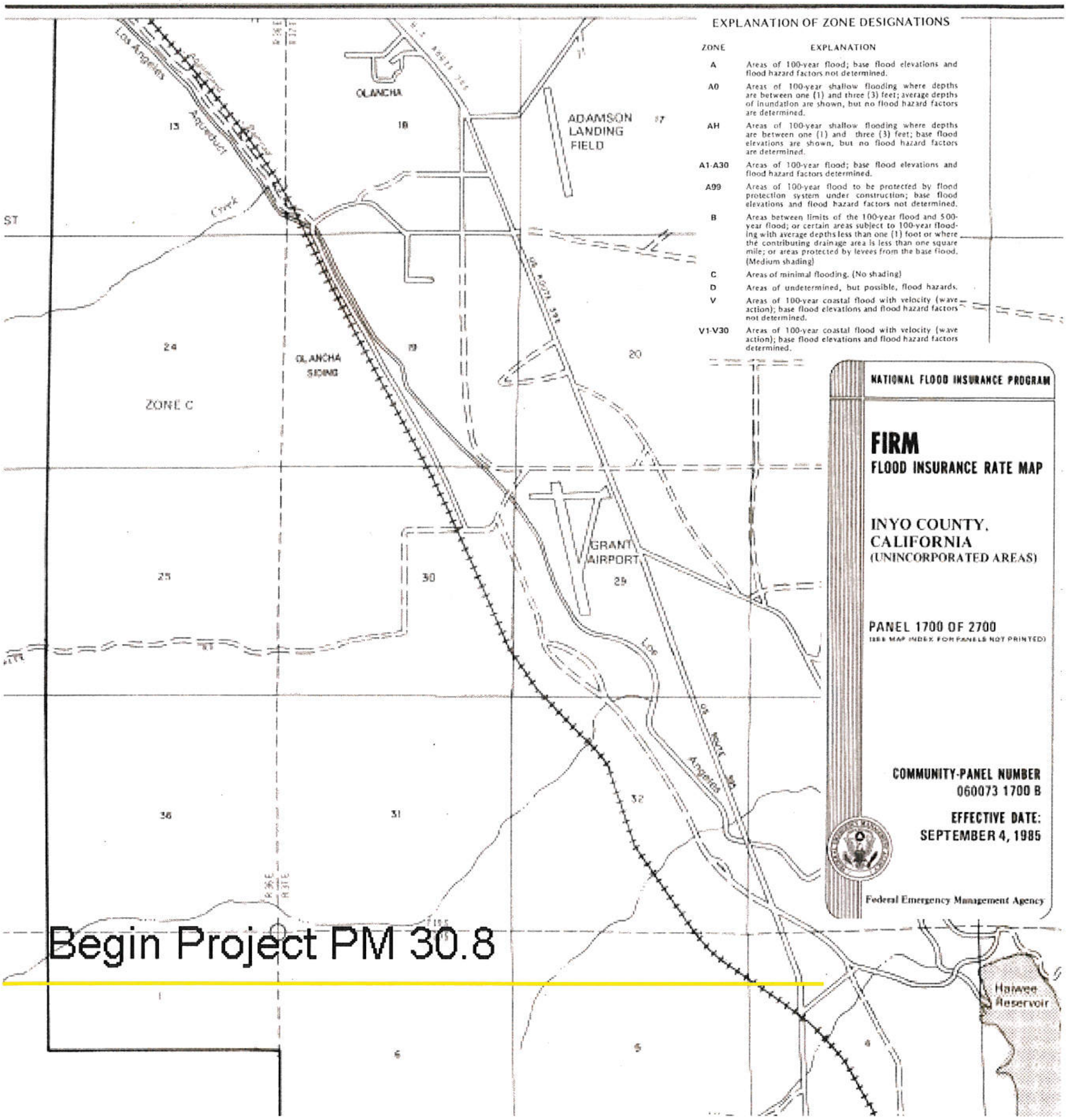
Attached Exhibits:

FEMA FIRM MAP #1 (North)
FEMA FIRM MAP #2 (South)
Large Drainage Basin Map (North)
Large Drainage Basin Map (South)
Los Angeles Aqueduct Overchute Structures #1
Los Angeles Aqueduct Overchute Structures #2
Los Angeles Aqueduct Overchute Structures #3
Los Angeles Aqueduct Overchute Structures #4
Los Angeles Aqueduct Overchute Structures #5
Los Angeles Aqueduct Overchute Structures #6
Mean Annual Rainfall Map

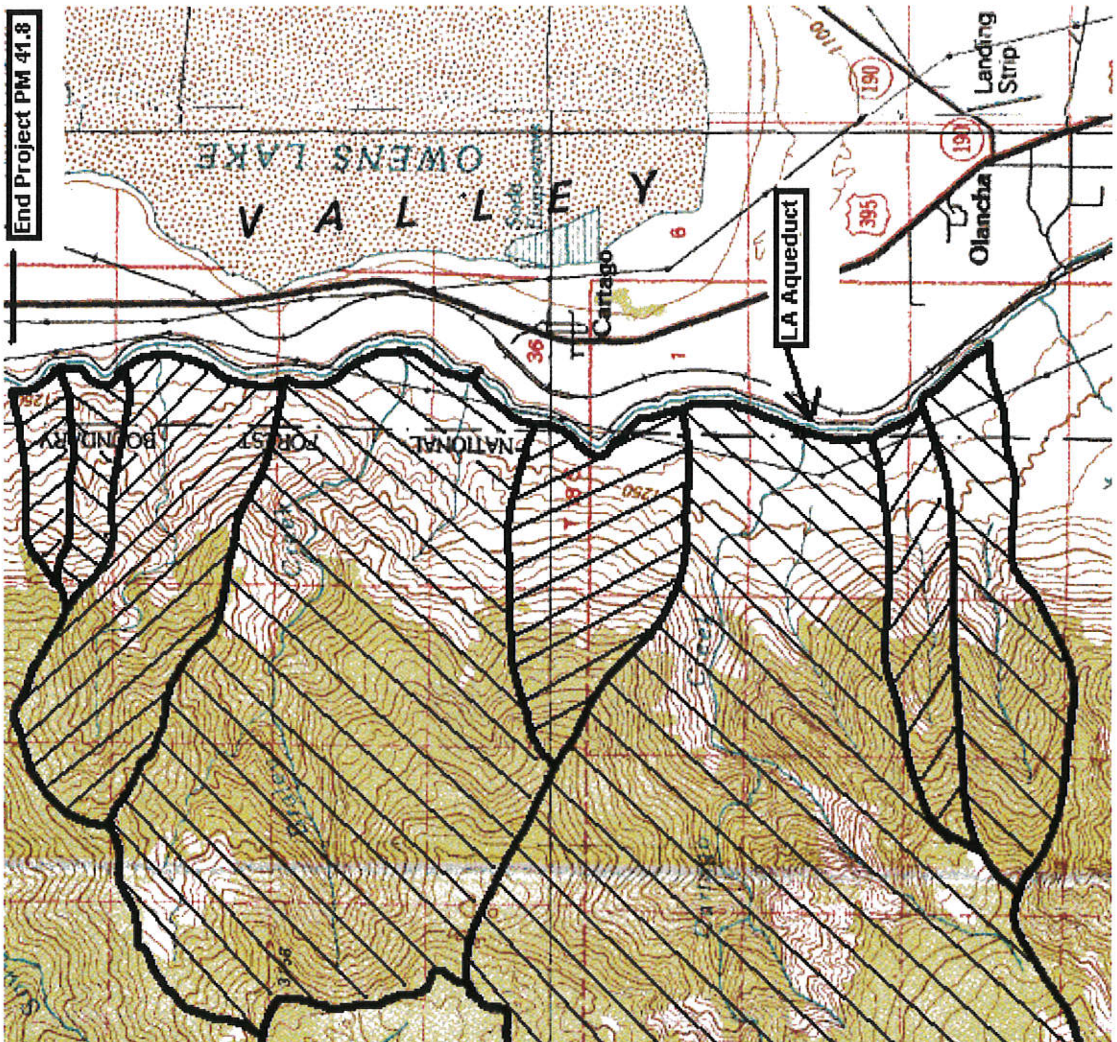
FEMA FIRM MAP #1 (North)



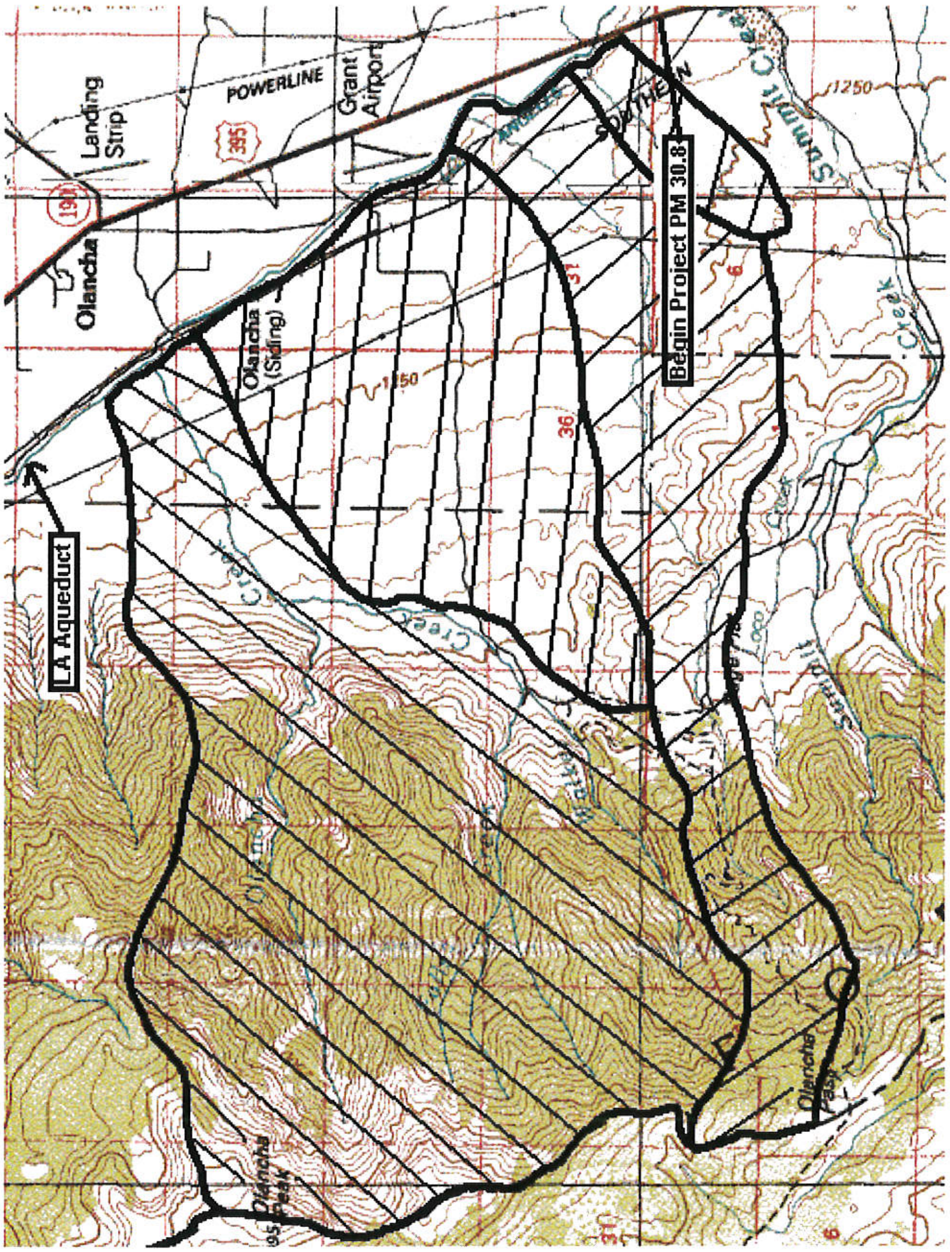
FEMA FIRM MAP #2 (South)



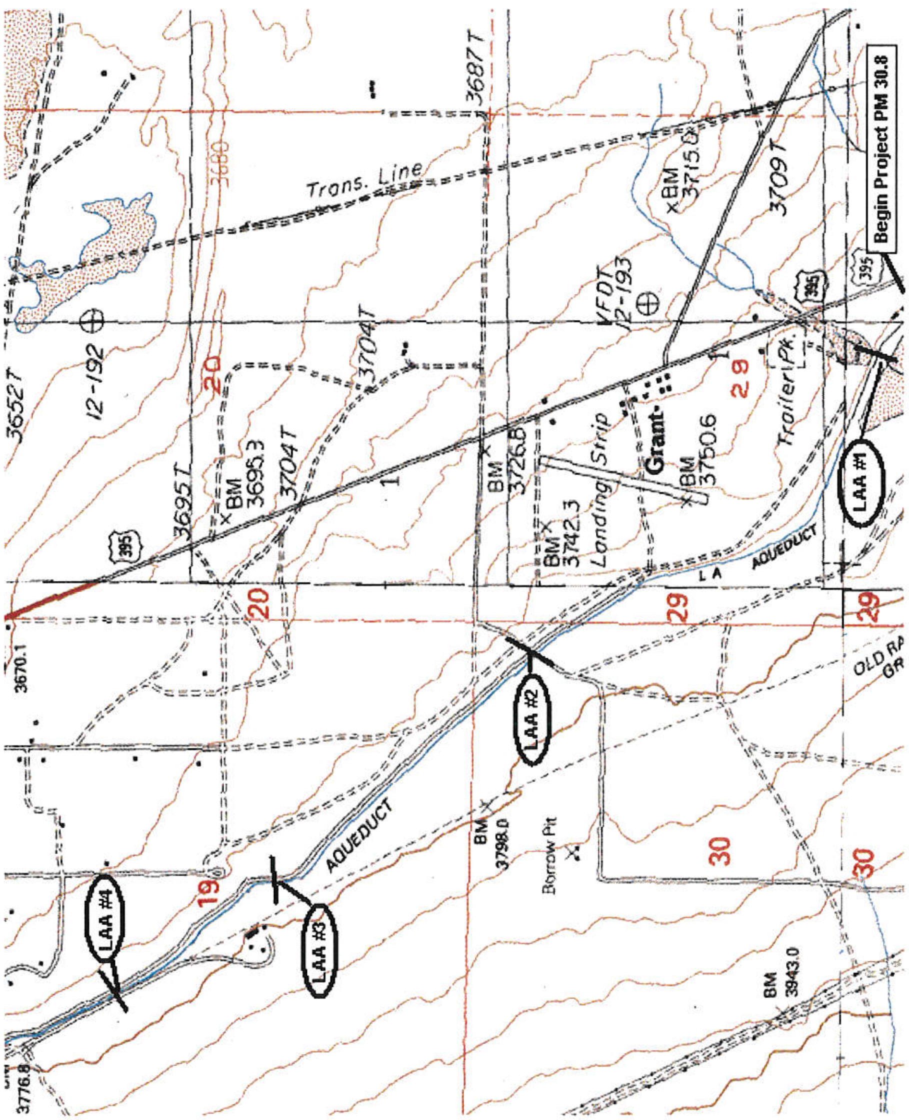
Large Basin Map (North)



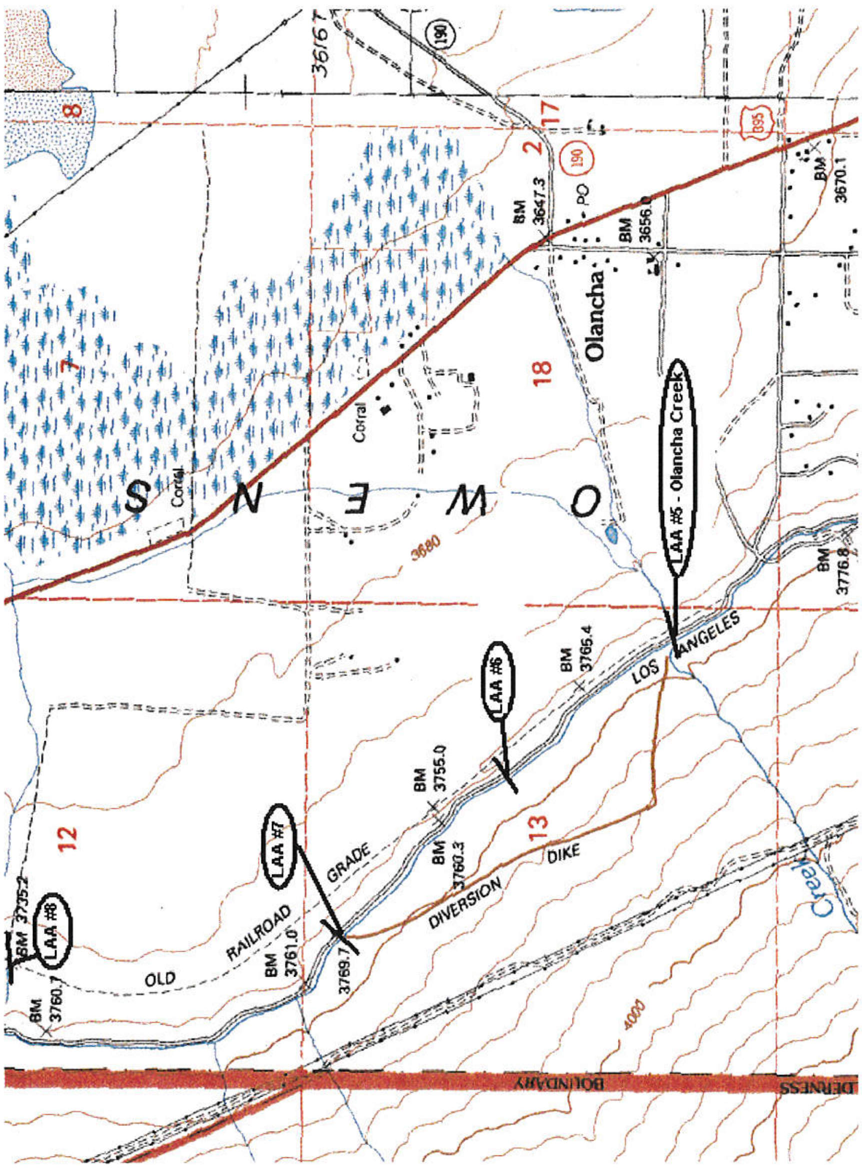
Large Basin Map (South)



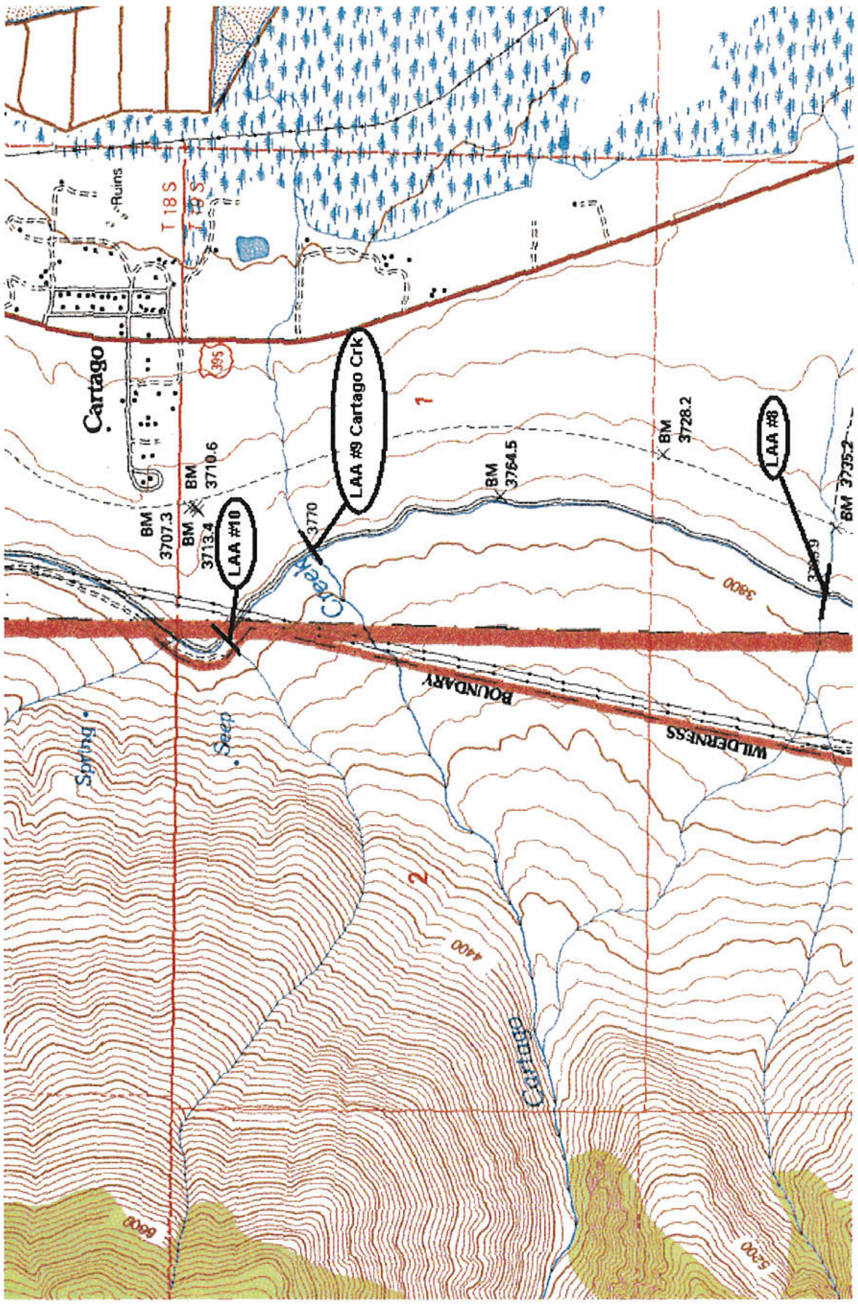
Los Angeles Aqueduct Overchute Structures Map #1



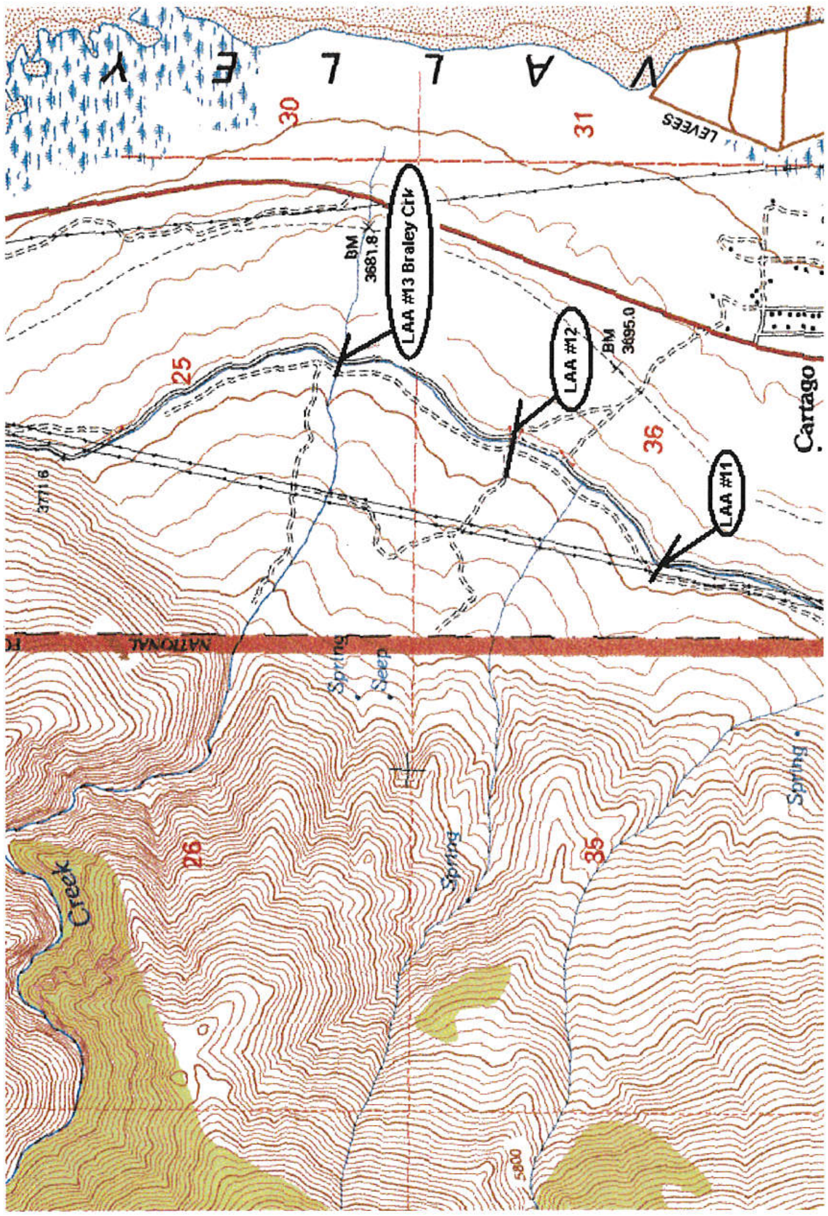
Los Angeles Aqueduct Overchute Structures Map #2



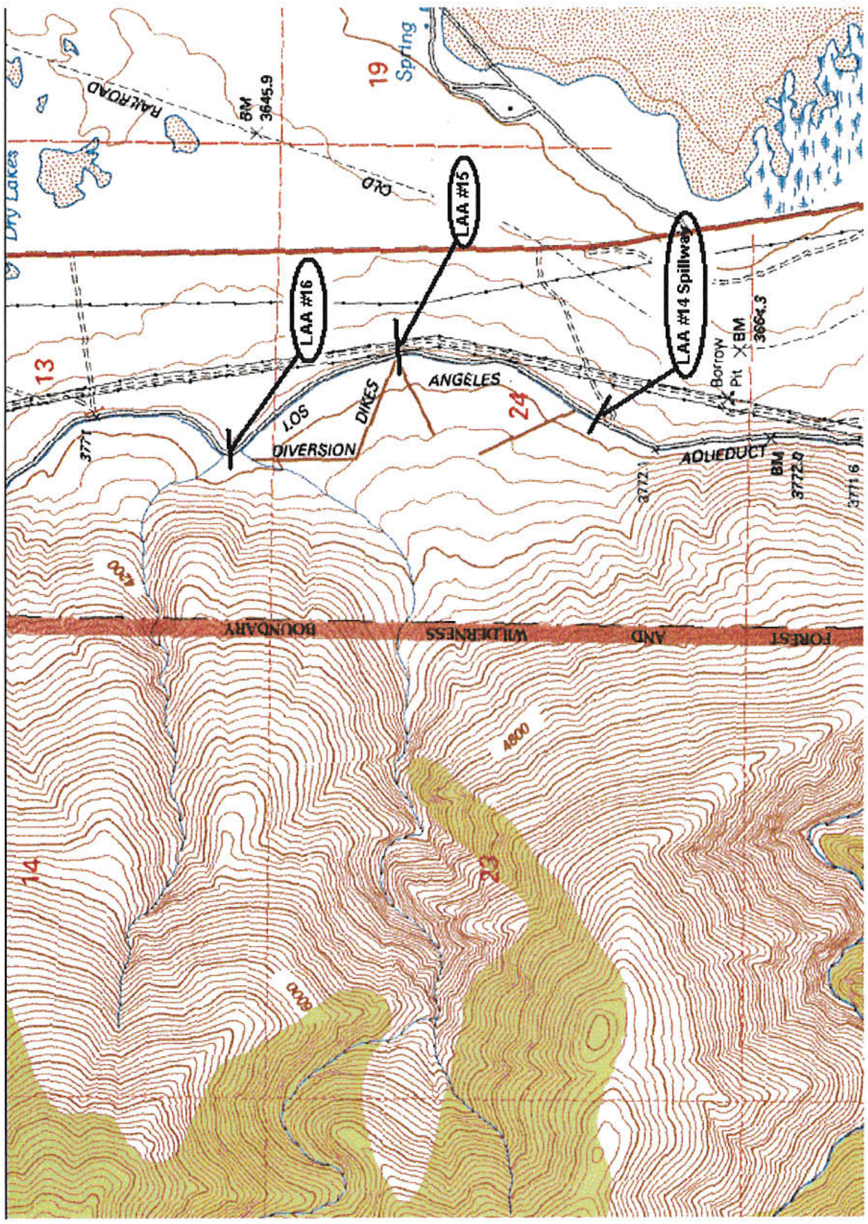
Los Angeles Aqueduct Overchute Structures Map #3



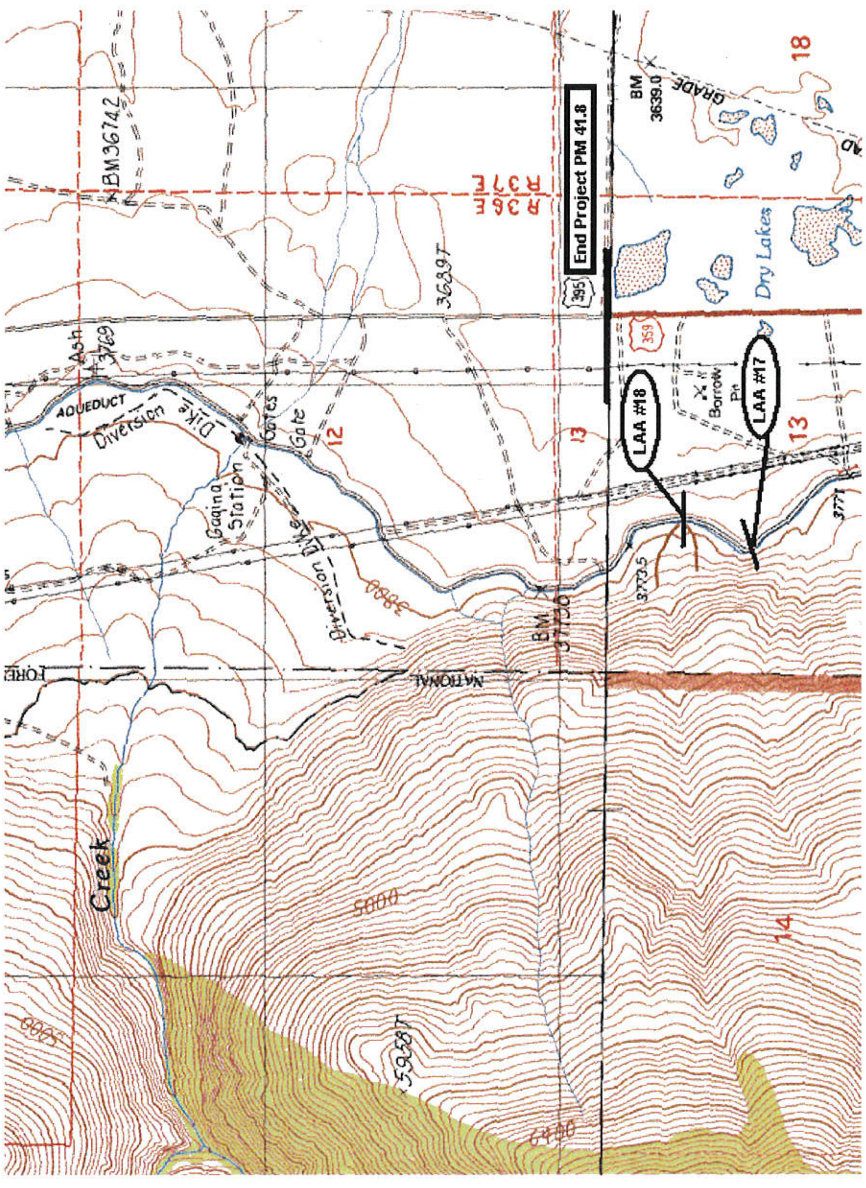
Los Angeles Aqueduct Overchute Structures Map #4



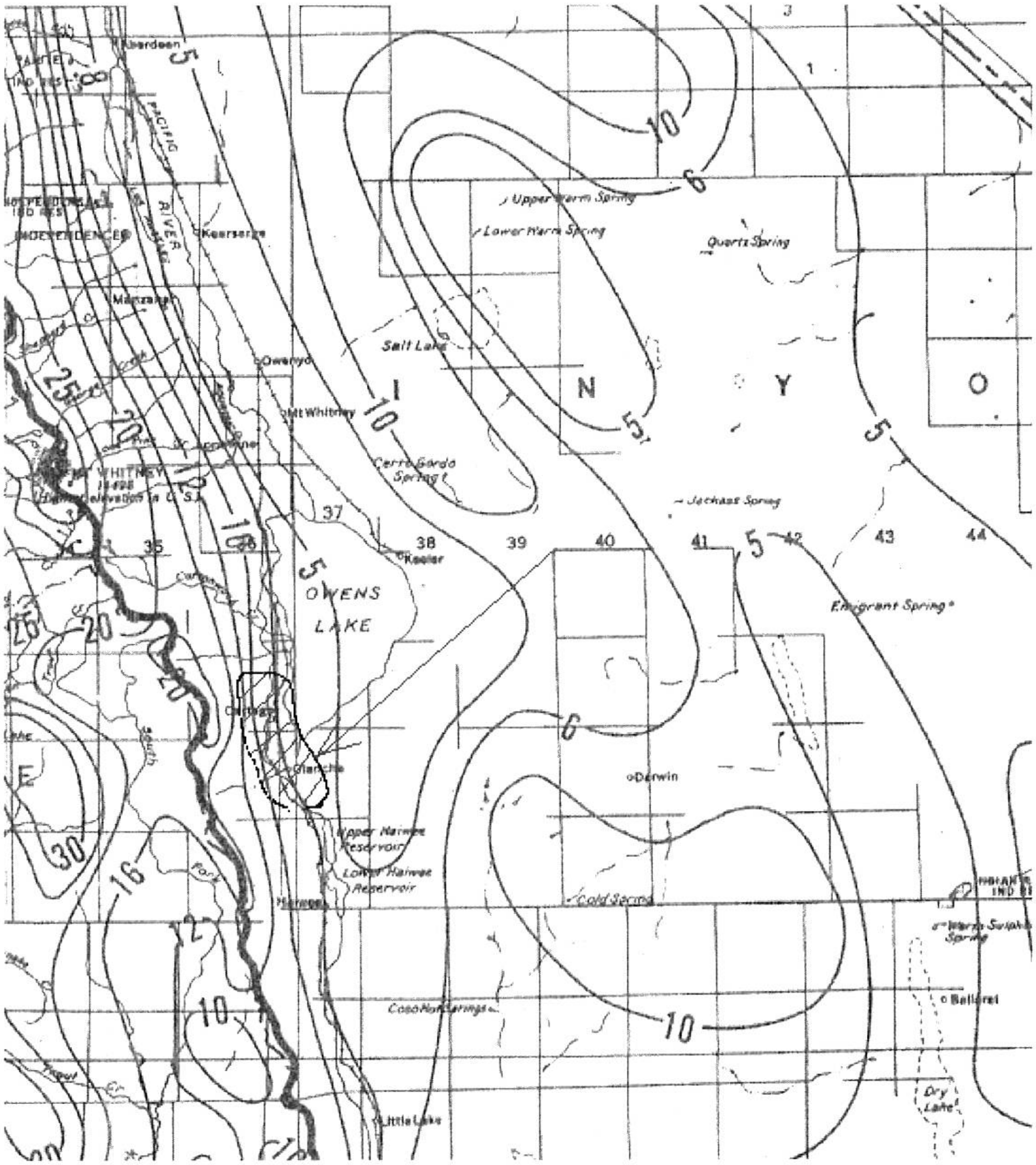
Los Angeles Aqueduct Overchute Structures Map #5



Los Angeles Aqueduct Overchute Structures Map #6



Annual Precipitation Map



Floodplain Evaluation Report Summary

Dist.: **09** Co.: **INY** Rte.: **395** K.P.: **49.6/67.3**
P.M.: **30.8/41.8**

Project No.: **09-213400** Bridge No.: **48-10**

Limits: **In Inyo County on Rte 395 through the communities of Olancha and Cartago from 0.8 km (0.5 miles) south of Los Angeles Aqueduct Bridge #48-10 to 0.5 km (0.3 miles) south of Ash Creek Bridge #48-11.**

Floodplain Description: **Olancha Creek, Cartago Creek, and Braley Creek overflows, alluvial fans, and ephemeral drainage washes and swales, and Los Angeles Aqueduct spillway emergency overflow.**

	Yes	No
1) Is the proposed action a longitudinal encroachment of the base floodplain?		**X**
2) Are the risks associated with the implementation of the proposed action significant?		**X**
3) Will the proposed action support probable incompatible floodplain development?		**X**
4) Are there any significant impacts on the natural and beneficial floodplain values?		X
5) Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, then explain.		X
6) Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).		**X**
7) Are Location Hydraulic Studies that document the above answers on file? If not, explain.	**X**	

PREPARED BY:

Truman P. Denio — 12/20/00
Signature- Hydraulics Engineer — Date

Mike Donahue — 1/16/01
Signature- Environmental Branch Chief — Date

Mark V. Rasthoffer — 1-10-01
Signature- Project Engineer — Date

I CONCUR:

E. G. Elliott — 2/1/01
Signature- FHWA — Date

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

M e m o r a n d u m

Flex your power!
Be energy efficient!

To: JUAN TORRES
ASSOCIATE ENVIRONMENTAL PLANNER

Date: JANUARY 31,2007

File: 09-21340K

From: ANDREW BRANDT
HYDRAULICS ENGINEER

Subject: FLOODPLAIN EVALUATION UPDATE

All previous information contained in the December 2000 Floodplain Evaluation Report & Location Hydraulics Study still applies therefore, no changes are necessary.

Preliminary Geotechnical Report and Errata

PRELIMINARY GEOTECHNICAL REPORT

for

Olancha/Cartago Four Lane PSR

Preliminary Alignments

for

Route 395

Between 0.8 km South of Los Angeles Aqueduct Bridge No. 48-10
And 0.7 km South of the Ash Creek Bridge No. 48-12

09-213400
09-Iny-395-KP 49.6/66.9 (PM 30.8/41.6)

Prepared by

California Department of Transportation
ENGINEERING SERVICE CENTER
Division of Structural Foundations

Office of Roadway Geotechnical Engineering-South

December 1999

TABLE OF CONTENTS

1. Introduction

The purpose of this study is to assess geotechnical issues that might affect each of the three alternatives being considered for replacement of the existing conventional two-lane Highway 395 with a four-lane expressway between KP 49.6 and 66.9 (PM 30.8/41.6) in Inyo County, California. The replacement starts at approximately 3 km south of the community of Grant ending at approximately 6.3 km north of Cartago. The four-lane realignment passes through the community of Olancha. The project "Olancha/Cartago Four Lane" can be identified as follows, 09-INY-395-KP 49.6/66.9 (PM 30.8/41.6), Expenditure Authorization # 09-213400. A vicinity map is attached (**Figure 1**). This study does not provide preliminary geotechnical recommendations for bridge structures and their approach embankments.

At the request of District 09, the Office of Roadway Geotechnical Engineering South (RGES) staff has prepared this Preliminary Geotechnical Report (PGR) based on literature study, local geological and geotechnical experience, and a site reconnaissance. The intent of this study is to provide preliminary geotechnical information for the District to use in assessing the environmental issues and potential costs associated with the alternatives. No subsurface exploration was performed for this PGR and therefore actual subsurface conditions may vary from those assumed herein. A more detailed investigation is required for specific design details after the preferred alternative is selected and the project receives Project Approval.

2. Pertinent Reports and Investigations

Since this project is in the Project Study Report (PSR) stage, the most pertinent report within Caltrans would be the original materials report for the project area. Such a report for this section of Highway 395 was not available for our review.

Several other reports and maps were utilized in preparing this report and a list of references is included as an attachment.

3. Description of Project Alternatives and Existing Facilities

Figure 2 (attached), provided to us by the District shows the three alternatives under consideration. **Table 1** provides a narrative of these alternatives as interpreted from **Figure 2.** Alternatives 1 and 2 are very close to the existing alignment over the entire length of the project. For the southern end, approximately half of its length, Alternative 3 is shifted a maximum of 1,000 m to the west of the present highway, placing it close to the Los Angeles (LA) Aqueduct. It also cuts through the southern end of a landing strip located west of the community of Grant.

The existing highway including the pavement is in good condition within the project limits. Most of the alignment is at about natural ground level. There are very few cuts. Cuts and fill slopes are stable without slip-outs and rock-falls. The existing fill and cut slope ratios are 1V:2H. The cuts and fills are no more than 3 to 5 m in height. There are erosion features at a few locations and at these locations there were no berms provided.

The vegetation on slopes is sparse to dense along the highway.

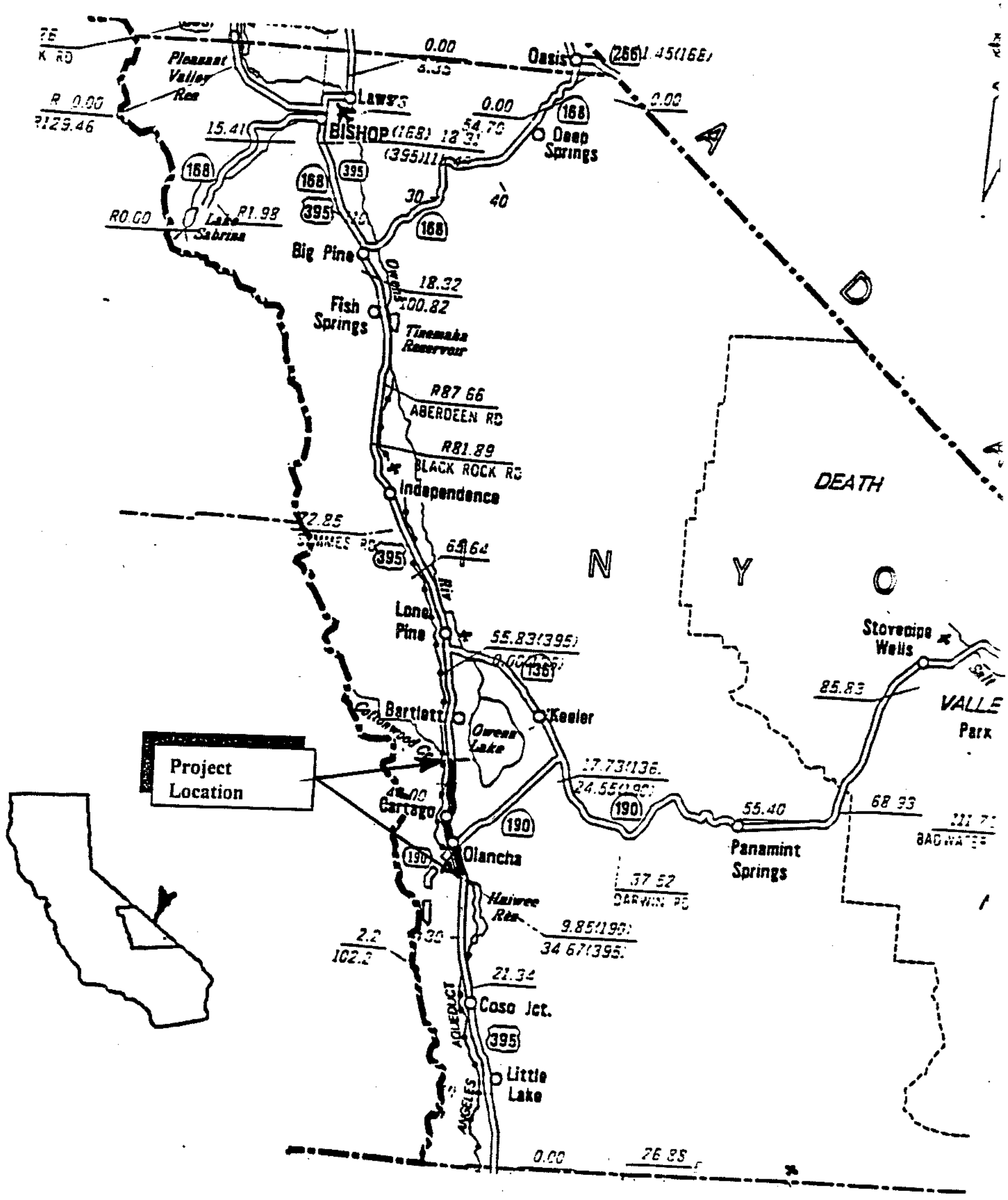
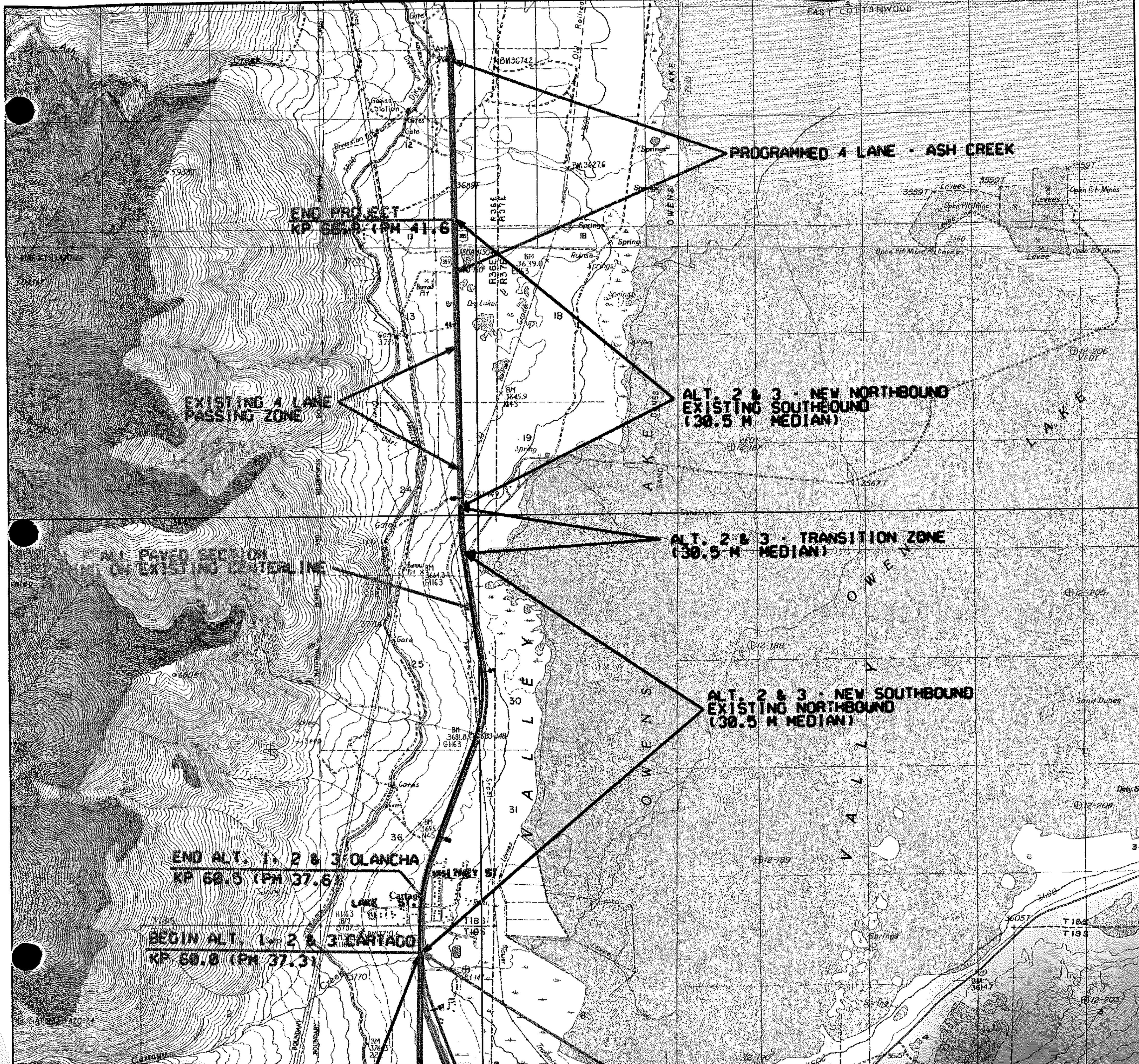


Figure 1: Vicinity Map: Olancha/Cartago Four Lane: 09-INY-395-KP 49.6/66.9 (Not to Scale)



OLANCHA/CARTAGO PSR

PRELIMINARY ALIGNMENTS

SCALE: 1" - 3000'

LEGEND:

EXISTING ALIGNMENT &
ALTERNATE NO. 1, PHASE 1 & 2

ALTERNATE NO. 2, PHASE 1

ALTERNATE NO. 3, PHASE 1

ALTERNATE NO. 2 & 3, PHASE 2

NOTE: PHASE 1-OLANCHA PSR
PHASE 2-CARTAGO PSR


WATER BOTTLING PLANT
APPROX. LOCATION
ALT. 2 - NEW NORTH
AND SOUTH BOUND
ALT. 3 - NEW NORTH AND SOUTH-
BOUND (30.5 M MEDIAN)
ALT. 1 - ALL PAVED SECTION
CENTERING ON EXISTING CENTERLINE
ALT. 2 - NEW SOUTHBOUND
EXISTING NORTHBOUND
BONE DRY BEER
APPROX. LOCATION
PROPOSED
BRIDGE
LOCATION
ALT. 3 - NEW SOUTHBOUND
EXISTING NORTHBOUND
EXISTING 4 LANE
(30.5 M MEDIAN)
KP 49.6 (PM 30.8)
BEGIN PROJECT
ALL ALTERNATIVES
LACY LANE
Olancha
SCHOOL ST.
FALL ST.
SHOP ST.
ROUTE 190
WALKER
CREEK RD.
CACTUS FLAT ROAD
OWENS VALLEY
RESERVOIR

Table 1
Alternative Routes for Olancha/Cartago Four Lane
09-INYO-395-KP 49.6/66.9 (PM 30.8/41.6)
09-213400

Description interpreted from Figure 2
Alternative 1 Widen existing highway centered on existing center line to an all-paved section 25 m (82 ft wide) (four 3.6 m (12-ft) lanes, 4.3 m (14 ft) paved median & 3.0 m (10 ft) wide shoulders.
Alternative 2 Add two new southbound lanes, keeping existing lanes for northbound traffic from south end northerly for nearly a mile; then construct new north & southbound lanes up to KP 60.0 (PM 37.3) As per drawing, this Alternative has new southbound and existing northbound lanes upto "**Transition Zone**" **(KP not known))** Then it has new northbound & existing southbound lanes to end of Project KP 66.9 (PM 41.6).
Alternative 3 Alternative 3 has new south & existing northbound lanes from beginning of project to 1.90 km (1.2 miles), and then has a northwesterly alignment, somewhat paralleling the aqueduct upto KP 60.0 (PM 37.3). Then, it closely follows Alternatives 1 & 2 upto the end of the project at KP 66.9 (PM 41.6).

Note 1: For all the above alternatives, a new bridge is proposed to cross the L.A. Aqueduct positioned to the west of the existing bridge, spaced to provide a 30.5 m (100 ft) median.

2. From the drawing, Alternative 3 apparently goes through an old airport runway near the Community of Grant.

3. KP of Los angeles Aqueduct Bridge No. 48-10 is 50.336 (PM 31.28)

4. Physical Setting

4.1 Climate

The average temperature ranges from 5.1°C in the winter to 27.1°C in the summer. The average rainfall in the project area is 130.9 mm per year. Historically, over 90 percent of the rainfall have fallen between the months of November and April. Average annual snowfall is 96 mm and the average snow depth is zero.

4.2 Topography and Drainage

The topography within the project limits is generally flat to rolling hills.

Within the project limits, runoff generally flows from west to east, draining from the Sierra Nevada's alluvial fans, collecting in ephemeral creeks and discharging into Owens Lake. At the time of reconnaissance in December 1998, the lake was mostly dry, especially in the vicinity of Highway 395. The LA Aqueduct, which flows from north to south on an alignment west of the proposed alignments, crosses the creeks, thereby requiring channels to carry the flow over the aqueduct at several locations. Similarly, the existing highway, as well as the proposed alignment alternatives also traverses the drainage area. In some locations, the existing highway facility has culverts for passing water from flash floods, but there are other locations where it appears that heavy rainfall or flash flooding allows the flood water to flow directly over the highway (see **Table 2** for locations on Highway 395).

4.3 Prior Land Use

It appears that the prior land use in this area has been predominantly residential and agricultural. The existing alignment passes through several towns and communities within the project limits. These can be expected to have old service stations, light manufacturing, etc, which may contain hazardous waste. We leave the conduct of an investigation to identify such potential sites that may lie within the limits of the proposed alternatives to the District 09 Hazardous Waste unit. In addition, an old railroad (Southern Pacific Transport Co.,) right-of-way parallels the alignment Alternative 3 for several kilometers. This also may be a potential source of hazardous waste.

4.4 Man-Made and Natural Features of Engineering and Construction Significance

The depicted alignment of Alternative 3 closely parallels the LA Aqueduct, most of which is in cut. Based on information provided by the Department of Water and Power of the city of Los Angeles, the canal is lined with unreinforced cement concrete. It is approximately 11 – 12 m wide at top and 4.5 m deep with side slopes at 1:1. It has a "splash wall" (personal communication by Robert Mannet, 1999). During our reconnaissance survey in December 1998, we were unable to observe the type and condition of the aqueduct channel lining to confirm the reported condition.

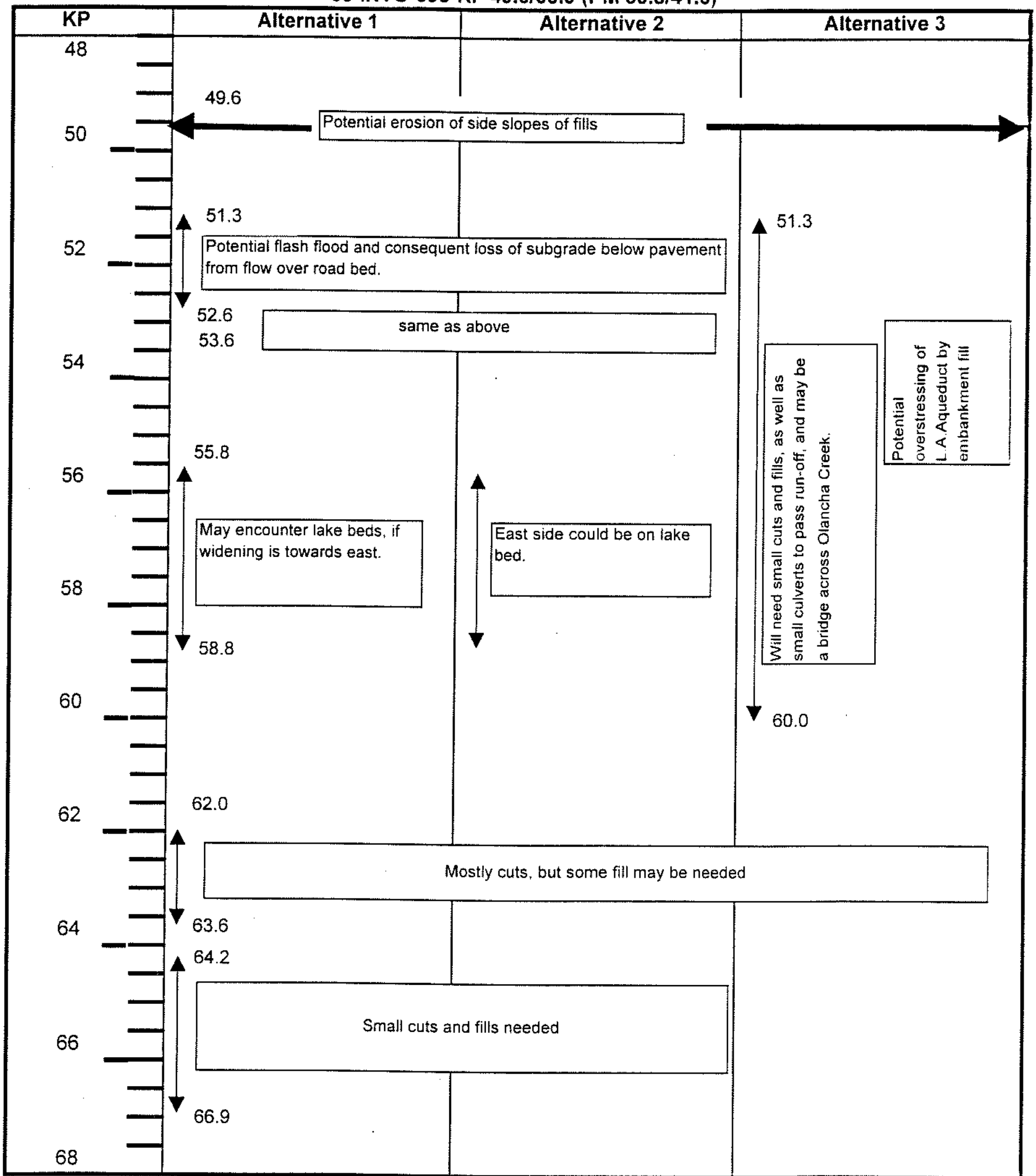
Alternative 3 alignment also cuts the southern end of a landing strip west of Grant (see **Figure 2**). It appears that this landing strip is used occasionally.

Areas of historical interest (on-surface or buried at shallow depths) could be encountered along any of the alignment alternatives. For example, an Indian burial site estimated to be 1,000 years old was identified in December 1998 in the middle of the

Table 2

Geotechnical Aspects of OLANCHA-CARTAGO FOUR LANE - HWY 395 09-213400

09-INYO-395-KP 49.6/66.9 (PM 30.8/41.6)



Note: KP values refer to existing Hwy 395 alignment..

(1 kilometer = 0.62 of a mile)

additional lane being constructed along Highway 395 between KP 66.5/68.6 (PM 41.3/42.6). While such areas can require specific geotechnical/design considerations, we defer to the District's archeological resources to identify and locate such sites.

5. Geology

5.1 Regional

This project is located in the Basin Ranges province of California. This province is a series of horst and graben extensional features that are oriented in a general north-south direction. The Owens Valley is one of these graben structures located between the Sierra Nevada Mountains to the west and the Inyo-White Mountains to the east. The Sierra Nevada and Inyo-White Mountains are rising with respect to the Owens Valley that is dropping along normal faults located on the east and west sides of the valley. Numerous alluvial fans have formed and are forming at the base of these mountain ranges along the edges of the Owens Valley.

5.2 Site

The area through which the proposed project will be built is underlain by a thick sequence of quaternary alluvium and colluvium. Drilling performed for the LA Aqueduct Bridge in 1977 and in 1980 at about KP 34.3 (PM 21.3) close to Highway 395 showed that the thickness of alluvial soils was at least 14 m (Cain, 1977; Rand, 1980). The depth to "rock-like" material is assumed to be in excess of 45 m (Rand, 1980).

The surficial soils can be classified as poorly sorted silty sand, sand, and gravel with scattered cobbles and boulders. Boulders are present in varying size and percentage, with some of the boulders near Olancha Creek close to the aqueduct being on the order of one meter in diameter.

In areas close to Owens Lake, the alluvial soils have more fines and less or no cobbles and boulders. In general, for portions of all three alternatives near Owens Lake, the soils tend to become more silty and clayey east of the existing alignment. North of KP 55.9 (PM 34.72) and approximately up to KP 57.4 (PM 35.7), Alternative 2 may encounter soft clay sediments of Owens Lake (lacustrine soils). Currently (1999), there is no water in the lake close to the existing alignment and portions of the lakebed show desiccation cracks. The depth of desiccation is not known. Similarly, from KP 63.6 (PM 39.5) to KP 64.0 (PM 39.8), all three alternatives may encounter soft clay sediments.

Figure 3 shows the approximate distribution of surficial soils over the area that encompasses the three alignment alternatives. The boundaries between different soil zones shown in the figure are approximate.

Two faults are adjacent to the project, the Sierra Nevada-Owens Valley and the Independence. Section 6.7 discusses the tectonics of these faults and their potential influence on the project.

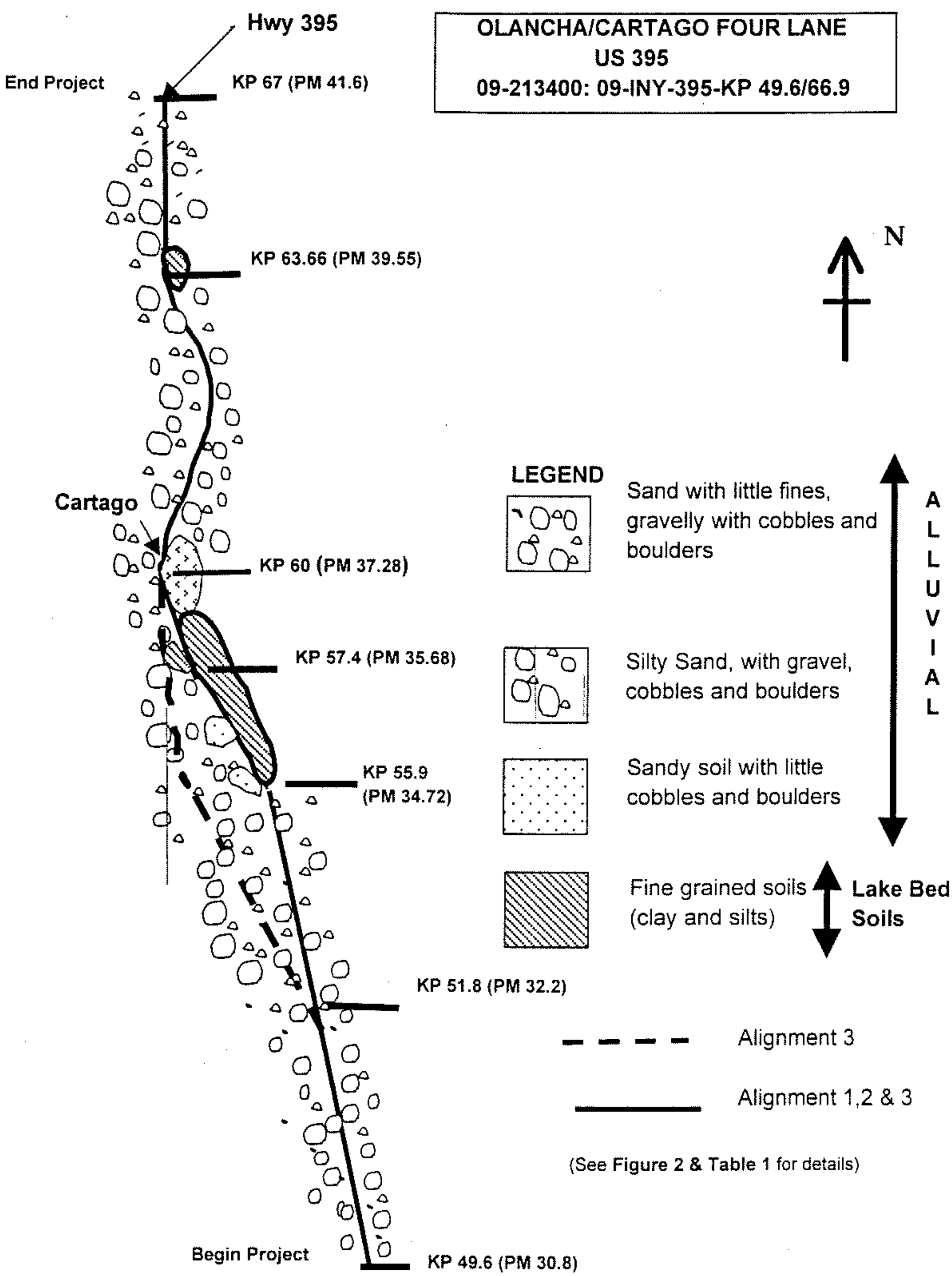


Figure 3: Approximate Distribution of SurfaceSoils) within the Project Area
(KP Locations are approximate and not-to-scale)

6. Geologic Considerations

6.1 Mineral Resources

Other than soil (alluvial) deposits that could be processed to generate sand and aggregate, no known mineral resources were identified within the project limits.

6.2 Petrology

There are no exposures of rock formations present within the project area. The alluvium and colluvium in the project area consist of materials derived locally from the Sierra Nevada mountains to the west, predominantly Cretaceous igneous granitic rocks with a few Mesozoic metavolcanic rocks.

6.3 Aggregate/Construction Material Sources

The alluvial and colluvial soils within the project limits could potentially be used as a source of sand and aggregate for construction. Boulders of igneous granitic origin can in general be suitable for use as construction aggregates if it is confirmed that crushed material derived therefrom conforms to the quality requirements of the Standard Specifications.

6.4 Excavation Characteristics

Excavation necessary for the project can be expected to be carried out by conventional earth moving equipment. Unless they can be incorporated into embankments or otherwise utilized for construction, the many boulders that are a part of the alluvium throughout a large area within the project limits may need to be separated from the rest of the excavated material, treated as "surplus material" and handled as per Standard Specification 19-2.06. Depending upon the height of embankment, the cobbles and boulders may be incorporated into the embankment material.

Large boulders might have to be removed from cuts where they are too large for conventional scrapers. Boulders exposed in cut slopes might necessitate individual removal and local restoration of the cut slope with compacted fill.

6.5 Scour

Several major drainage courses or creeks cross each of the alternative alignments. These drainage courses are fed by melting snow from higher elevations in the Sierra Nevada. Springtime flows can erode the streambeds and banks, creating significant bed load in the flow to be passed under the future highway. Bed load should be considered in selecting culvert sizes and types and in designing culvert entrances.

6.6 Groundwater

6.6.1 Sources

The groundwater in the project area originates from infiltration of rainwater through the alluvial fans that abut the east flank of the Sierra Nevada Mountains.

A foundation investigation performed in 1980 for Bridge No. 48-0015R at KP 34.3 (PM 21.3) over the LA Aqueduct did not encounter groundwater to the maximum boring depth of 12 m (approximate bottom of hole elevation of 1076 m) (Rand, 1980). However, an earlier investigation performed in November 1977 at about the same location showed presence of water at 10.7 m below ground surface (approx. water elevation at 1079.5 m) in one of the two bore holes drilled (Cain, 1977).

There are two wells V404 and V405 near the community of Olancha (approximate KP 55.5) maintained by the Department of Water and Power of the city of Los Angeles. Based on measurements taken in 1988, the water levels in wells V404 and V405 were respectively, 12 m and 15 m below ground level.

A water bottling plant is just south of Cartago to the east of the proposed alignments. The plant utilizes a well or wells for the production of bottled water. The plant could not be reached for information on depth to groundwater.

6.6.2 Effect on Groundwater Regime

We do not expect any of the three alternatives to have an effect on the groundwater in the project area based on our knowledge of the alternative geometrics and profile.

There is an area adjacent to the west shore of Owens Lake between Olancha and Cartago that appears as a swamp on the map provided by Project Development. This area has been utilized in the past as cattle rangeland and for other agricultural uses and appears to be heavily irrigated. This presence of water is not from groundwater but from heavy irrigation in this area. All of the swampy area lies to the east of the alignment alternatives.

6.7 Seismicity

This project is located in a seismically active area. The geologic processes that have caused earthquakes in the past can be expected to continue. The seismic event we feel that is likely to produce the greatest bedrock accelerations at the site would be a moderate or large event on the active Sierra Nevada-Owens Valley fault zone. A fault is considered by the State of California to be active if geologic evidence indicates that movement on the fault has occurred in the last 11,000 years, and potentially active if movement is demonstrated to have occurred in the last 2 million years.

There is geologic information that indicates the presence of an active fault near the project area. The M7.8, 1872 Owens Valley earthquake was along part of the normal fault located along the west edge of the Owens Valley. Fault traces and other displacement features of this earthquake have been mapped within 2.7 km west of the project site (1994, Beanland and Clark). Also, several traces of this fault have been mapped under the Alquist Priolo Special Studies Zones Act, January 1, 1990, Olancha Quadrangle, near the project site. The closest traces zoned to be active by Alquist Priolo are within 30 m of the proposed project alignment near Cartago. The Independence fault has been mapped 5 km to the west of the project, but is not considered active by the State of California under Alquist Priolo.

6.8 Tsunamis/Seiches

A seiche is defined as a free or standing wave oscillation of the water surface of an enclosed basin. At this time there is no possibility of this phenomenon due to lack of water in the Owens Lake.

6.9 Geologic Structure

Alluvium, colluvium or lakebed sediments underlie the entire project. Structural features related to these sediments range from massive undifferentiated sediment deposits to relict stream channels with associated graded bedding. Lakebed sediments should be expected to include more bedded deposits of silts and clays. As mentioned in Section 5.2, the depth to "bedrock like" material is assumed to be in excess of 45 m (Rand, 1980).

6.10 Rockfall and Landslides

Neither rockfall nor landslides are expected to form within the project limits due to the generally flat topography of the area. However if the project is constructed in cut, cobbles and boulders exposed in cut slopes could evolve into a rockfall potential over time. This potential can be mitigated by limiting the depth of cuts to 5 m or less, using slope ratios of 1V:2H or flatter, and by localized scaling of exposed rocks from graded slopes.

6.11 Geothermal Activity

No known geothermal activity was identified within the project limits.

6.12 Snow Avalanches

Although snow does fall within the project limits most winters; a snow avalanche within the project limits is highly unlikely due to the generally flat topography of the project. The base of the Sierra Nevada Mountains lies several thousand feet to the west of the westernmost alternative for this project.

7. Geotechnical Engineering Considerations

7.0 General

At the writing of this report, profile grades for the proposed alternatives were not available. Therefore, the following assessments are conceptual.

7.1 Embankment Foundations

Table 2 provides an overview of the geotechnical aspects of this project. **Figure 3** gives approximate boundaries between different types of surficial soils.

Except for the soils encountered in the lakebed (lacustrine soils), the alluvial soils (silty sands, gravels and cobbles) are of low compressibility and have adequate bearing strength to support the road structure and the traffic loads. The lakebed soils and other soils with high fines content may exhibit low strength, high swell and high compressibility. The method of 'removal and replacement' has been found in the past to be an economic treatment of embankment foundation areas if the soft compressible layer extends to less than 4.5 m below the ground surface. However, *in lieu* of removal or in conjunction with partial removal other methods can also be used such as:

Surcharging,
Allowing time for settlement to near completion before paving,
Using flexible pavement or,
Flattening of side slopes.

If the thickness of compressible foundation soil exceeds 4.5 m, and if the project embankment loading would produce excessive settlement, the above design measures that include either one or more of the following could be required:

Flatter embankment slopes or slopes with berms,
Surcharging,
Allowing time for settlement to near completion before paving,
Lightweight fills,
Wick drains,
Reinforcement with geofabrics or geogrids.

Use of geofabrics or geogrids will not reduce settlement but will improve resistance of the embankment slopes against lateral deformation. Temporary support measures or flattened temporary slopes may be needed for excavation in such soft soils but this is considered unlikely in the project area.

Site-specific exploration and analysis will be necessary to characterize these lakebed soils, conduct design analyses, and to recommend measures for construction. The analysis will consider possible rise in water level or partial submergence of embankment slopes in the future, although we consider such water level rise to be unlikely.

7.2 Embankment Materials

In general, the alluvial soils can be used as fill for embankments. Because of the presence of boulders in the alluvial soils, compaction procedures specified in Section 19-5.02 will need to be followed. Where the thickness of fill is less than 1 m, special provisions for processing of alluvial soils to remove particles of sizes larger than the depth of compacted fill shall be included. Soil and/or cobbles/boulders not used for construction should be treated as "surplus material." Please refer to Section 6.4 of this report for handling surplus material.

For preliminary design, the R-value of the compacted alluvial soils may be assumed to be greater than 20 or other value as assigned by District Materials.

The Earthwork Factor (EWF) for alluvial and colluvial soils with cobbles and boulders may be assumed to be 0.9 if there is no screening of bouldery material. If the boulders are removed before being used as embankment material, EWF may be assumed to be 0.75. These EWF values are approximate and for estimating purposes only.

Lakebed soils are less desirable for use as embankment due to their potentially higher salt contents, their potential for volumetric changes (shrink – swell) with changing moisture content, and their potential low R-values.

7.3 Erosion

Since the surficial alluvial and colluvial soils appear to contain little to no plastic fines, erosion potential of these soils within the project area could be high. Erosion was noted at two places along the existing Highway 395 (see **Table 2**). At about KP 49.6 (PM 31.0) erosion had occurred on the west side shoulder of southbound Highway 395. All three-alignment alternatives are expected to cross this erosion area.

In the second area, flash flooding has apparently caused runoff to flow over the roadbed at about KP 51.3 (PM 31.88) and at about KP 52.6 (PM 32.67). Potential for sheet flow over the roadbed exists at KP 53.6 (PM 33.3). Raising the roadbed for the three alternatives above potential run-off levels of future flash floods and providing for cross drainage would mitigate erosion problems in such areas.

To minimize erosion and formation of gullies on embankment or cut side slopes, topsoil obtained from excavations and/or the lakebed may be used as outer cover for the slopes.

AC dikes along with catchment basins or overside drains can be used to divert pavement runoff away from the slopes of embankments for embankment heights more than 3.5 m and side slopes steeper than 1V:3H. If the embankment slopes are flatter than 1V:3H and heights less than 3.5 m, unconcentrated pavement runoff may be allowed to flow over the slope.

7.4 Control of Subsurface Water

Ground water is expected to be deep in relation to the magnitude of the proposed construction and is expected to have little impact on construction and performance of embankments, cuts and the road structure (see Section 6.6.1). Effect of groundwater on liquefaction potential at the project site is discussed in Section 7.5.

7.5 Ground Shaking and Liquefaction

The area under study is tectonically active. As discussed in Section 6.7, the closest fault to the site is the Sierra Nevada-Owens Valley fault. This fault is capable of producing a maximum credible earthquake (MCE) of 8.0 (Mualchin, 1996). The resulting ground shaking or motion is characterized by the peak ground acceleration. For preliminary design, the peak ground acceleration at the project site can be assumed to be 0.6g (Mualchin, 1996).

Since we have not performed subsurface investigation for this report, we cannot presently assess the relative density distribution of coarse-grained soils that could undergo densification during ground shaking resulting in settlement of the roadbed. The alluvium and colluvium at alignment Alternative 3 could be more compressible than soils at alignment Alternatives 1 and 2. Furthermore, should the LA Aqueduct fail during ground shaking, the escaping water could adversely affect alignment Alternative 3.

Ground shaking is the primary cause of structural damage during an earthquake and is considered one of the most likely damage-producing phenomena for this project. The magnitude, duration and vibration frequency characteristics will vary greatly, depending on the particular causative fault and its distance from the project. It is also reasonable to assume that surface rupture may occur near or within this project site in the future if a moderate or large earthquake on the Sierra Nevada-Owens Valley fault occurs. Due to the locations of the fault relative to the various project alternatives, this potential cannot be entirely mitigated. However, this potential also exists for the existing Route 395 and therefore the proposed project does not generate a new hazard exposure. The lower the heights and more shallow the depths of proposed embankments and cuts, the easier it will be to repair damage caused by either ground rupture or shaking. Also, scaling boulders from cut slopes or above the tops of cuts during construction would preclude seismically induced rockfall.

Liquefaction is the transformation of cohesionless soil from solid to liquid state as a result of increased pore water pressure and the consequent reduced effective stress. Liquefaction can occur in areas of cohesionless soil with high groundwater levels when these areas are subjected to earthquakes. Liquefaction has been documented to affect soils to approximately 15 m deep during prolonged periods of ground shaking.

As discussed in Sec. 6.6-1, groundwater at the project site may be encountered at a depth of 10 m to 15 m below ground surface. The potential for liquefaction along the length of the project for all three alternatives can not be assessed at the present time. Additional subsurface and groundwater investigations will be required to assess this potential earthquake induced phenomenon.

7.6 Settlement

Alignment Alternatives 1 and 2 for the most part involve reportedly minor fills over short stretches. Thus, the settlement magnitude can be expected to be small and will not result in distress to the road structure. We do not believe that earthwork quantities will require adjustments to account for settlement.

We do not anticipate specific subgrade treatments or reinforcement being needed where the alignments are over alluvial (coarse-grained) soils.

Portions of Alternatives 1 and 2 may be over compressible lakebed soils between KP 55.8/58.8 (PM 34.7/36.6). Settlement magnitudes and time-periods over which settlement occurs depend upon the thickness of fill, thickness of compressible layer as well as compressibility of the lake bed soils. Mitigation measures are discussed in Section 7.1. Within these limits, Alternative 3 is essentially over alluvial soils. The eastside of the existing alignment of Highway 395 seems to be over the lakebed between KP 63.6/64.0 (PM 39.52/39.76). We do not have any information on the subsoil conditions in this stretch. However, there are no signs of distress of the roadbed or instability of the embankment slopes of the existing highway within this stretch. For conceptual design, both excavation and embankment slopes may be assumed to be at 1V:3H over these and other segments where soft, compressible foundation soils are anticipated.

7.7 Slope Stability

The maximum height of cut along the existing Highway 395 is approximately 3 m between KP 64.0/64.2 (PM 39.8/39.9). This stretch of cut at 1V:2H appeared stable with no evidence of erosion. Cut slopes in alluvial soils and fills made of alluvial soils are expected to be stable at 1V:2H.

Fill slopes on lakebeds may require flatter slopes such as 1V:3H. Use of reinforcing elements such as geofabrics or geogrids may enable construction of 1V:2H fill slopes on the lakebeds.

7.8 Volumetric Stability of Embankment and Subgrade Materials

The alluvial soils are not of expansive type, i.e., they do not undergo volume changes when their water content changes. If the alluvial/ colluvial soils (near LA Aqueduct) are collapsible, they could settle under embankment loading if the aqueduct fails and water is released flooding the embankment foundation soils. This potential can be mitigated by ground modification techniques such as removal and compaction (subexcavation) of the collapsible soils if found to exist in the embankment foundation area.

The lakebed deposits are compressible and potentially expansive. Section 7.1 discussed measures to minimize the effects of compression of these soils on road structures. If found to be expansive, the lakebed soils will affect the thickness of the structural section and, depending upon the degree of expansion potential, may require removal, treatment, or confinement under (embankment) loading.

8. Potential Project Impacts on Man-Made and Natural Features

8.1 Stability

8.1.1 Slope Ratio Effects

Based on our current knowledge of profile grade and alignment for the three alternatives, we do not anticipate the need to vary slope ratios to avoid specific offsite features.

8.1.2 Project Impacts on Offsite Features/Facilities

As mentioned in Section 4.4, if Alternative 3 is founded on embankment close to the L.A Aqueduct, lateral stresses from the embankment could exert load on the aqueduct. Therefore, toes of embankments for Alternative 3 should be set back from the aqueduct.

8.2 Utility and Nearby Structure Settlement

Since all three alternative alignments are mostly in sandy soils with gravels and cobbles and the heights of embankments will presumably less than 3 m to 5 m, settlement-induced distress to nearby structures and utilities is not anticipated. The relationship of alignment Alternative 3 to the aqueduct has been discussed.

9. Corrosion

Soils evaluated by District 09 Materials during a 1980 foundation investigation for Bridge No. 48-0015R by District 09 Materials Section were considered non-corrosive. Thus, for conceptual design purposes, it is assumed that alluvial soils are non-corrosive. Until test data can indicate otherwise, we believe the lakebed soils and alluvial soils close to the shores of Owens Lake should be considered as corrosive as they may contain residual salts left by evaporation.

10. Hazardous Waste Impact

As noted in Section 4.3, there is some potential for hazardous waste impact for all the three alternatives. Should the District Hazardous Waste unit discover such materials, proposed remediation measures should be reviewed by Roadway Geotechnical Engineering South as remedial treatments can have geotechnical effects.

11. Preliminary Recommendations

11.1 Exploration and Investigations

For preparation of final geotechnical design report (GDR), detailed subsurface investigations that include trenching, drilling and laboratory testing will be required.

Because of the presence of cobbles and boulders in alluvium, subsurface exploration by trenching is recommended in areas where cuts and fills are of height less than 3 m. We anticipate a total of 20 to 25 trenches over the selected alignment alternative.

In addition to trenching, a series of borings (approximately 10 to 15 holes with a maximum depth of 15 m) will be drilled at locations where fill height could exceed 3 m. If alignment Alternative 3 is chosen and a bridge structure is proposed to cross Olancha Creek, then HQ Office of Structure Foundations should be contacted for bridge foundation investigations.

Logging of trenches and borings will be performed by engineers and/or geologists from the Office of Roadway Geotechnical Engineering - South. Duration of exploration will depend upon the type of route alternative chosen for final design. For project scheduling, a period of two to three months should be assumed to complete field investigations. The project scheduling should also take into account the fact that the time period for field investigations (trenching, drilling and sampling) is limited to April – September.

Since the terrain is generally flat, access to drill sites is possible *via* cross roads from Highway 395. Presence of boulders on the surface may limit movement of drilling equipment. Special permits may be needed to drill in lakebeds (Owens Lake).

Bag samples from trenches and undisturbed and disturbed samples from bore holes will be collected and geotechnical tests performed to develop geotechnical design parameters. We will coordinate this effort with District/Regional Materials so that they may also gather samples for materials testing, if they desire.

It is anticipated that a total of ten to twelve months will be required to complete the investigations and submit the geotechnical design report (GDR).

11.2 Geotechnical

11.2.1 Areas and Alternative Measures for Stabilization

Within or immediately adjacent to the project area, there are no known zones of instability such as landslides that will require remediation.

Where the alignment alternatives pass through the compressible lake bed deposits in the Owens Lake, measures to reduce settlement of embankment will be needed, such as:

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1. Remove the lakebed soil and replace it with compacted fill derived from alluvial soil
2. Surcharge the fill to accelerate settlement
3. Use flexible road pavement
4. Flatten side slopes to 1V:3H or more
5. Lightweight fills
6. Provide reinforcement fabric or geogrid at lakebed grade or within embankment structure

Where alignment Alternative 3 passes close to the LA Aqueduct, the toe of embankment fills not exceeding 5 m shall be at least 8 m clear from the aqueduct. For cut depths of 0 to 3 m, the top of cut slope should be 5 m clear from the aqueduct. For cut depths deeper than 3 m but not exceeding 5 m the clear spacing should be at least 10 m.

For fill side slopes, use slope ratio of 1V:2H for heights less than 3 m. For heights greater than 3 m, use slope ratio of 1V:3H.

11.2.2 Cut/Embankment Slope Design

Few cuts and fills appear to be needed for alignment Alternatives 1 and 2. Alignment Alternative 3 may need deeper fills, but we believe it to be not more than 5m. Such slopes can be at 1V:2H. However, slopes at 1 H:3V or flatter are recommended for resisting erosion and eliminating the need for AC berms. No benches are required for cuts, which are not expected to exceed 5m in height. For cuts and fills in lakebed soils, design slopes at 1V:3H.

For alignment Alternative 3, maintain a clear distance between toe of the fill and the aqueduct of 8 m or more.

For preliminary design and estimating purposes, assume an Earthwork Factor of 0.9 if cobbles and boulders are not removed. If cobbles and boulders are removed before being used as fill, assume 0.75.

11.2.3 Dewatering

No dewatering is anticipated during construction.

11.2.4 Embankment Foundation Treatment

In general, no special treatment of natural subgrade to receive fill embankments is needed in alluvial soils, except that large boulders may have to be removed. Depending upon compressibility and thickness of soils in the lakebed, mitigation measures discussed in Section 11.2.1 may be necessary. The need for such measures can be reduced or eliminated by keeping new embankment heights to moderate limits (4 – 5 m) and/or selecting more westerly locations for embankments.

11.2.5 Erosion Considerations

At locations where erosion is anticipated, the primary mitigation measure should be flattening of side slopes at 1V: 3H or flatter. To minimize erosion on fill slopes, the slope ratio should be at 1V:3H or flatter. As an alternative, AC curbs and catch basins or overside drains could be considered. In addition, drought-resistant plants may be used on the slopes of fills and cuts.

For erosion occurring due to sheet flow of offsite water flowing over the road surface, increasing the height of fill and/or providing culverts to pass the storm flow should be considered.

11.2.6 Material Sources

As stated in Section 6.3, the alluvial soils along the three alignment alternatives appear to be a suitable source material for aggregates or embankment. However, laboratory testing will be required to confirm their suitability as construction material. We have not assessed other sites as potential sources of fill or other materials.

11.2.7 Material Disposal

During the reconnaissance survey, we did not identify disposal areas.

11.3 Corrosion

Additional sampling and testing for corrosion should be conducted when an alignment alternative is chosen.

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Memorandum

Flex your power efficient!

To: Mathew Palmer
Associate Environmental Planner
Central Sierra Analysis Branch

Date: May 12, 2010

File: EA 09-213400
Inyo-395
PM 29.2/41.8

From: Ron Chegwidden, PE
Transportation Engineer
Caltrans District 9, Design 1 - Branch J

Subject: Updated Project Description for Geotechnical Study

Objective

This memo is to serve as a notice that the findings in the attached study will not change with this modified project description below.

Project Description

The California Department of Transportation (Caltrans), as CEQA lead agency, and the Federal Highway Administration, as NEPA lead agency, propose to convert approximately 12.6 miles of the existing U.S. Highway 395 from a two-lane conventional highway into a four-lane expressway or partial conventional four-lane highway from post mile 29.2 to post mile 41.8 in Inyo County. The project proposes five alternatives with varying amounts of construction on new alignments. The new facility would have four 12-foot lanes with a median of variable width. There would be paved shoulders throughout the project, five feet wide on the inside and ten feet wide on the outside. This project also proposes constructing new concrete bridges to cross the Los Angeles Aqueduct, and installing concrete box culverts and smaller pipe culverts throughout the project limits to promote drainage. Under some of the proposed alternatives, this project may extend State Route 190 to intersect with the proposed improvements. A borrow site at the end of Fall Road and south of Olancha Creek would be used to provide soil and road materials for the project.

Alternative 1

This alternative proposes constructing segments of conventional all-paved, conventional divided and controlled access four-lane divided highway. The new facility would follow the existing highway alignment, with the existing lanes being incorporated into the new facility. While this alternative would not bring the entire project up to expressway standards, it would still provide a facility meeting the concept facility of four-lanes in Inyo County.

The proposed segments of this alternative are as follows:

- Begin Work – 0.45 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.8) Four-lane divided expressway. The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 0.5 miles south of Cactus Flat Road (PM 32.1) Four-lane all-paved highway. The existing highway will be widened asymmetrically to the east.

- 0.1 miles south of SR 190 junction (PM 34.6) Four-lane all-paved highway. The existing highway will be widened asymmetrically to the west.

- 0.9 miles north of SR 190 junction (PM 35.6) Four-lane divided expressway. The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 0.3 miles south of Lake Street (PM 37.3) Four-lane all-paved highway. The existing highway will be widened asymmetrically to the west.

- 0.6 miles north of Whitney Street (PM 38.4) Four-lane divided expressway. The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 2.3 miles north of Whitney Street (PM 40.1) Four-lane divided expressway. The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.

- End Work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 41.8)

The four-lane all-paved highway would consist of four 12-foot lanes and 10-foot outside shoulders, with the northbound and southbound lanes separated by a 14-foot paved median. The new facility would be widened asymmetrically to conform to existing environmental and right of way constraints.

In particular, the segment north of SR 190 would be widened to the west to avoid wetlands that exist in the irrigated pasture lands to the east. Access would not be controlled and the paved median would be delineated for turning movements, which would allow the existing access through the corridor to be preserved. Due to the access considerations, the all-pave segments would be designated as conventional highway and would be designed for a 65 mph design speed.

The four-lane divided highway would consist of four 12-foot lanes, with 5-foot inside shoulders and 10-foot outside shoulders. The new lanes would be constructed parallel to the existing lanes and would be separated by at least a 100-foot unpaved median. In the segments on the north and south sides of the project, access from the side would be controlled to existing intersections and other significant access points and access across the facility would be restricted to at-grade median crossovers.

The segment of divided highway between PM 35.6 and PM 37.3 would not have controlled access and would be designated as conventional highway. The four-lane divided highway would meet expressway standards and would be designed for a 75 mph design speed.

This alternative uses the existing highway and would be constructed largely at grade, so there would be limited opportunity for adjustments in horizontal and vertical alignment. The existing substandard curve at PM 37.2 would be replaced with a larger curve, but otherwise the new alignment will follow the existing horizontal alignment. Similarly, the vertical profile would only be changed appreciably near PM 40.0 on the north side of Willow Dip to improve sight distance. In addition, the roadway cross-slopes in the new facility would vary due to conforming to the existing roadway.

There are two structures associated with this alternative. A reinforced concrete bridge would be built near PM 31.3 and would carry the new southbound lanes across the Los Angeles Aqueduct. A new reinforced concrete box culvert may also be required near PM 37.30 and would carry the N. Fork of Cartago Creek under the new all-pave facility. There would be no undercrossings proposed for this alternative.

Alternative 2

This alternative proposes constructing a controlled access four-lane divided expressway throughout the project. In Olancha, the new expressway facility would follow the existing highway alignment, but would be constructed adjacent to the existing highway. Through Cartago and north to the end of the project, the new expressway would still follow the existing alignment, but would incorporate the existing lanes into the new facility. This alternative would provide the ultimate concept facility for U.S. 395.

The proposed segments of this alternative are as follows:

- Begin Work – 0.45 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.8) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 1.1 miles south of Cactus Flat Road (PM 31.5) New northbound and southbound lanes will be constructed to the east of the existing highway.

- 0.3 miles south of SR 190 junction (PM 34.4) New northbound and southbound lanes will be constructed to the west of the existing highway.

- 0.3 miles south of Lake Street (PM 37.3) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 2.3 miles north of Whitney Street (PM 40.1) The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.

- End Work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 41.8)

The four-lane divided expressway would consist of four 12-foot lanes, with 5-foot inside shoulders and 10-foot outside shoulders. The northbound and southbound lanes would be separated by at least a 100-foot unpaved median. Access from the side would be controlled to existing intersections and other significant access points and access across the facility would be restricted to at-grade median cross-overs. With controlled access and divided lanes, the traveling speeds are anticipated to be higher, so the new expressway facility would be designed for a 75 mph design speed.

This alternative would be constructed parallel to the existing highway. However, construction of a new facility would allow the improvement of the existing horizontal alignment with larger radius curves. The facility would again be constructed largely at-grade, with the only major adjustment in vertical profile occurring at the passing lanes north of Willow Dip. The new construction would also provide consistent roadway cross-slopes.

The existing highway would be extended along the new alignment to SR 190 and would be converted to frontage road between PM 31.9 and PM 37.1. With connections at major intersections and at either end, the frontage road would serve as a collector road to the new expressway. It would also preserve the existing uses and access on the southwest and northeast sides of Olancha. Once the project is completed, the frontage road would be relinquished to Inyo County.

Access to the new expressway would be provided at existing intersections with State Route 190 and several Inyo County roads: Cactus Flats Road, Walker Creek Road, Fall Road, School Street, Lake Street, and Whitney Street. The intersections would be reconstructed and realigned to conform to the new facility. Access to parcels abutting the existing highway would be provided from the proposed frontage road, existing dirt roads, and other significant access points.

There are several structures associated with this alternative. A reinforced concrete bridge would be built near PM 31.30 and would carry the new southbound lanes over the Los Angeles Aqueduct. Two reinforced concrete box culverts may also be required near PM 37.30 to carry the N. Fork of Cartago Creek under the new expressway. Two reinforced concrete box culverts are also proposed near PM 38.30 and would serve as multi-purpose undercrossings under the new expressway. Minor grading would be required to construct a new dirt road to connect to existing dirt roads nearby.

Alternative 2A

This alternative is similar to Alternative 2 and proposes constructing a controlled access four-lane divided expressway throughout the project. In Olancha, the new expressway facility would still follow the existing highway alignment, but would be constructed adjacent to the existing highway.

Instead of passing through Cartago, though, this alternative would pass to the west of Cartago and then return to the existing alignment. This alternative would also provide the ultimate concept facility for U.S. 395.

The proposed segments of this alternative are as follows:

- Begin Work – 0.45 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.8) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 1.1 miles south of Cactus Flat Road (PM 31.5) New northbound and southbound lanes will be constructed to the east of the existing highway.

- 0.3 miles south of SR 190 junction (PM 34.4) New northbound and southbound lanes will be constructed to the west of the existing highway.

- 0.9 miles north of SR 190 junction (PM 35.6) New northbound and southbound lanes will be constructed to the west of the existing highway and will pass west of Cartago.

- 0.8 miles north of Whitney Street (PM 38.6) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 2.3 miles north of Whitney Street (PM 40.1) The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.

- End Work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 40.8)

As with Alternative 2, this alternative would be constructed parallel to the existing highway through Olancha. Beginning at PM 35.6, the alignment would diverge from the existing highway as it passes to the west of Cartago and then return to the existing highway near PM 38.6. Due to this diversion, this alternative would require a significant change in vertical profile as it climbs the alluvial fan to the west of Cartago. The diversion also makes this alternative longer by about 0.3 miles.

The existing highway would still be converted to a frontage road, but the frontage road would extend further to the north of Cartago to join the new alignment, which would preserve the existing uses and access through Cartago as well. The length of frontage road that would be relinquished to Inyo County would be increased to 6.2 miles. The number of access points to the new expressway would be reduced by one as the intersections at Lake Street and Whitney Street would now connect to the frontage road. An additional access point would be provided south of the Crystal Geyser Bottling Plant to improve their access to the new expressway.

The number of structures required with this alternative would be the same as Alternative 2. However, the western alignment would change the location of the proposed reinforced concrete box culverts. The box culverts required for the N. Fork of Cartago Creek would be relocated to the west as would the box culverts required for the proposed multi-purpose undercrossings. The relocated undercrossings would require additional grading to restore access to the existing dirt roads in the area. There would also be an alternative location available for the multi-purpose undercrossings on the southwest side of Cartago.

Alternative 3

This alternative is also similar to Alternative 2 and would construct a controlled access four-lane divided expressway throughout the project. Rather than following the existing highway, the proposed alignment would pass to the west of Olancha and return to the existing alignment south of Cartago.

Through Cartago and north to the end of the project, the new expressway would follow the existing alignment and would incorporate the existing lanes into the new facility. This alternative would also provide the ultimate concept facility for U.S. 395.

The proposed segments of this alternative are as follows:

- Begin Work – 0.45 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.8) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 0.5 miles south of Cactus Flat Road (PM 32.1) New northbound and southbound lanes will be constructed to the west of the existing highway and will pass west of Olancha.

- 0.3 miles south of Lake Street (PM 37.3) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 2.3 miles north of Whitney Street (PM 40.1) The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.

- End Work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 41.8)

Beginning at PM 32.1, the alignment for this alternative diverges from the existing highway as it passes to the west of Olancha and then returns to the existing highway near PM 37.3. Due to the diversion, this alternative would require a significant change in vertical profile as it climbs the alluvial fan west of Olancha. It would also require that SR 190 be extended approximately 0.7 miles to meet the proposed alignment. The diversion makes this alternative about 0.2 miles longer.

The existing highway would be converted to frontage road, but the frontage road would begin near PM 37.3 and extend south of Olancha to join the proposed alignment near PM 32.4. The length of frontage road that would be relinquished to Inyo County would be reduced to 4.8 miles. The number of access points to the new expressway would be reduced by five as several of the access points in the Olancha area would now connect to the frontage road. Access would still be provided at the existing intersections with Lake Street and Whitney Street in Cartago.

The number of structures and location of structures required for this alternative would change due to the western alignment. Rather than being distributed through several irrigation channels, the crossing of Olancha Creek would occur at one location in an incised channel and could require reinforced concrete box culverts. Box culverts would still be required for the crossing of the N. Fork of Cartago Creek and the proposed multi-purpose undercrossings north of Cartago. An alternative or additional location for multi-purpose undercrossings would also be available near Olancha Creek. Additional drainage structures may be required to handle overflows of the Los Angeles Aqueduct from large storm events.

Alternative 4 (*All West Alternative*)

This alternative would construct a controlled access four-lane divided expressway for the entire length of the project. The new expressway would be constructed west of the Los Angeles Aqueduct and would pass to the west of both Olancha and Cartago. It would return to the existing highway north of Cartago and continue to follow the existing alignment to the end of the project, incorporating the existing lanes into the new facility.

The proposed segments of this alternative are as follows:

- Begin Work – 1.4 miles south of L.A. Aqueduct Bridge, #48-10 (PM 29.9) The existing lanes would be rehabilitated for use as northbound and southbound lanes.
- 1.3 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.0) New northbound and southbound lanes will be constructed to the west of the existing highway and will pass west of Olancha and Cartago.
- 1.3 miles north of Whitney Street (PM 39.1) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.
- 2.3 miles north of Whitney Street (PM 40.1) The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.
- End Work – 0.2 miles south of Ash Creek Bridge, #48-11 (PM 41.8)

This alternative would construct a four-lane divided expressway similar to Alternative 2. However, the location of the facility would be much higher on the alluvial fans west of Olancha and Cartago. As a result, there would be substantial changes from the existing profile and considerably more earthwork. The proposed alignment would also be about 1.5 miles longer and would require that SR 190 be extended approximately 1.1 miles to meet the proposed alignment. Due to the increases in length and earthwork, this alternative has the highest cost of all alternatives.

The existing highway would be converted to frontage road. The frontage road would begin near PM 30.4 and continue north along the existing alignment to join the proposed alignment north of Cartago.

The length of frontage road that would be relinquished to Inyo County would increase to 7.6 miles. The number of access points to the new expressway would be reduced to only three – the intersection with SR 190 and the southern and northern termini of the frontage road – and all existing roads would connect to the proposed frontage road.

This alternative would be west of the Los Angeles Aqueduct and would not enjoy the protection from alluvial flooding that the aqueduct currently provides. As a result, a significantly larger drainage network would be required to protect the roadway from potential flooding. It may even be necessary to construct drainage channels along the western boundary of the roadway to intercept and collect major storm flows.

This alternative would also require substantially more structures. Two bridges would be required to carry the southbound and northbound lanes across the Los Angeles Aqueduct west of Cartago. An additional bridge would also be required to carry the extension of SR

190 across the Los Angeles Aqueduct. There would also be a substantial increase in the number of box culverts. The proposed undercrossings would be constructed, and would meet an added need of providing access under the new facility for migrating deer. The proposed locations for box culverts are shown below:

<u>PM - Description</u>

31.3 - Dry Wash

32.0 - Dry Wash

34.7 - Olancha Creek

36.6 - S. Fork Cartago Creek

37.6 - N. Fork Cartago Creek

38.5 - Multi-purpose undercrossing

34.7 - Multi-purpose undercrossing (alternative site)

No Build Alternative

The “No Build” Alternative would leave this segment of U.S. 395 in its current configuration as a two-lane conventional highway. This would not address the project purpose and need to increase safety, improve level of service, and provide four-lane route continuity. As traffic volumes increase, the level of service will continue to deteriorate and the number of accidents would be expected to continue to increase. As a result, this alternative is not recommended.

Rejected Alternatives

<u>Alternative 3A</u>

As noted in the Project History Section, Alternative 3A was developed as a result of a Value Analysis Report (VAR) that was prepared for this project. This alternative would have passed to the west of both Olancha and Cartago, but would have stayed on the east side of the Los Angeles Aqueduct.

However, private development had increased along the proposed alignment for Alternative 3A since it was developed in 2000. Since Alternative 4 would have served the same purpose and would not require the take of the recently developed land, Alternative 4 was chosen over Alternative 3A. In addition, Alternative 3A would have had significantly higher noise and traffic impacts due to its proximity to the communities. As a result, Alternative 3A was rejected by the Project Development Team in the summer of 2007 in favor of Alternative 4.

<u>Alternative 2R (*Design Option 2R*)</u>

This alternative was the original alignment for Alternative 2 that was developed in early bypass studies and was included in the 1999 PSR-EO. It would have followed the same alignment as Alternative 2, except that the alignment would have continued past SR 190 (PM 34.6) on the east side of the existing highway up to about PM 35.6, where it would have crossed back over to the west of the existing highway. Since this alignment would significantly reduce the right of way impacts, the cost of construction, and some of the environmental impacts in northwestern Olancha, it was reevaluated during the consideration of alternatives for this project.

However, wetlands were determined to be present in the pasturelands north of SR 190 and east of the existing highway. Since jurisdictional wetlands must be avoided, this alternative was removed from consideration.

Historic Property Survey Report and Supplemental

Historic Property Survey Report
Olancha/Cartago Four-Lane Project, US Route 395
Inyo County, California

09-INY-395-KP 49.6/66.9 (PM 30.8/41.8)
E.A. 09-213400

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March 2004

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Chapter 1. Summary

The California Department of Transportation (Caltrans)—in conjunction with a coalition of Regional Transportation Planning Agencies and the Federal Highway Administration (FHWA)—proposes improvements to a segment of US Route 395 (US 395) in Inyo County, California (Figure 1, Figure 2). The proposed Olancha/Cartago Four-Lane Project (the Project) will convert approximately 11 miles of two-lane conventional highway to four-lane expressway in Owens Valley near the southern end of Owens Lake. Due to funding from the FHWA, the undertaking is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations [Title 36 CFR, Part 800].

Cultural resources studies supporting the Project were conducted in accordance with the January 1, 2004, *Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (the Programmatic Agreement). This report is intended to fulfill three of the FHWA's Section 106 responsibilities under the Programmatic Agreement: to delineate the Project's Area of Potential Effects (APE); to summarize the results of the effort to identify cultural resources within the APE; and to evaluate those resources for their eligibility for inclusion on the National Register of Historic Places (NRHP).

Regarding the first two Section 106 responsibilities, pursuant to Stipulation VI.B of the Programmatic Agreement, Caltrans has documented the Project's APE and conducted a reasonable and good faith effort to identify historic properties within that APE. Caltrans is not requesting concurrence on the adequacy of the APE and the identification efforts from the California State Historic Preservation Officer (SHPO). Regarding the third Section 106 responsibility, this report only partly fulfills the evaluation of historic significance. In accordance with FHWA policy and the *Environmental Handbook, Volume II, Cultural Resources* (Caltrans 2001a), §2-4.1, the evaluation of some sites was postponed until a recommended alternative is selected in order to avoid unnecessary damage to those resources. Thus, Caltrans is requesting SHPO concurrence only on those properties for which Caltrans has made an eligibility determination. Consultation with the SHPO will continue when other resources are evaluated.

Appendices for this *Historic Property Survey Report* include an *Archaeological Survey Report* (Appendix A), a report on excavations at 15 prehistoric archaeological sites (Appendix B), a *Historical Architectural Survey Report* (Appendix C), a *Historic Study Report* (Appendix D), and a report on Native American historical information (Appendix E). Correspondence appears in Appendix F and additional information appears in Appendix G. Appendix H is a confidential appendix that includes information about sacred lands within the APE.

The *Archaeological Survey Report* (Parr et al. 2001) documents an intensive pedestrian archaeological survey of a 3,400-acre study area that encompassed all proposed project alternatives and a buffer zone that would accommodate a wide range of possible design modifications. Performed by the Center for Archaeological Research (CAR) at the California State University, Bakersfield, the survey recorded 31 prehistoric sites, 20 historical sites, and four sites with both a prehistoric and historical component.

The archaeological excavation report, *Lacustrine Lifestyles Along Owens Lake: NRHP Evaluation of 15 Prehistoric Sites* (Byrd et al. 2003), documents investigations within portions of the APE that would be impacted by project-related ground disturbing construction activities, regardless of which build alternative is selected as the recommended alternative. This portion of the APE, essentially a 228-m-wide (750-ft) corridor centered on the existing highway, is referred to as the Phase-2 Study Area. The Phase-2 Study Area differs from the APE in several ways, which are discussed in detail in Chapter 2 of this report.

The Phase-2 Study Area contains 17 prehistoric archaeological sites, three of which are dual component sites. Of these, two sites were determined to be ineligible for the NRHP prior to this investigation: CA-INY-291/H and -371. No further studies were conducted at these sites during this investigation. ASM Affiliates, Inc., of Encinitas, California, conducted excavations at the other 15 prehistoric sites. Of these 15 sites, two had been found eligible for the NRHP prior to this Project: CA-INY-43 and -1317. Portions of those two sites extend into the undertaking's Phase-2 Study Area and, because no excavations had ever been performed within those portions, effects testing was conducted at each overlap location to determine whether archaeological deposits contributing to each site's eligibility were present. Results of the investigation at these two sites are summarized in Table 1-1.

Table 1-1: Previously Identified Historic Properties within the Phase-2 Study Area

Historic Property	Area of Overlap Contains Deposits that Contribute to the Resource's NRHP Eligibility?
CA-INY-43	No
CA-INY-1317	Yes

Of the remaining 13 prehistoric archaeological sites, five were determined eligible for the NRHP and eight were determined ineligible (Table 1-2).

Table 1-2: NRHP Eligibility for Prehistoric Archaeological Sites

Eligibility Determination	Site
Eligible	CA-INY-1991/H (prehistoric component) CA-INY-5967 CA-INY-5984 CA-INY-6021 CA-INY-6263
Ineligible	CA-INY-290 CA-INY-4837 CA-INY-5956 CA-INY-5958/H (prehistoric component) CA-INY-5964 CA-INY-5966 CA-INY-5981 CA-INY-5990

The *Historical Architectural Survey Report* (Dodd 2003) documents built-environment resources within the APE (direct and indirect). Performed by the California State University, Bakersfield, the survey examined 87 buildings and structures. Study findings are summarized in Table 1-3.

Table 1-3: NRHP Eligibility for Built-Environment Resources

Eligibility Determination	Site
Previously Determined Ineligible	CA-INY-4607H Bridge No. 48-0010
Eligible	The Old Olancha Schoolhouse
Ineligible	35 Built Environment Resources (see § 5.4 and Table 5-6)
Exempt from Evaluation	49 Built Environment Resources

The *Historic Study Report* (Baxter and Allen 2003) evaluates ten historical archaeological sites within the Phase-2 Study Area. For two homestead sites, CA-

INY-5953/H and -5958/H, Baxter and Allen concluded that the sites appear eligible for the NRHP. However, Caltrans disagrees with that conclusion and is requesting concurrence from the SHPO that the sites are not eligible. The two perspectives on the eligibility of these two sites are discussed in detail in Chapter 5 of this report. Caltrans' determinations of eligibility are summarized in Table 1-4.

Table 1-4: NRHP Eligibility for Historical Archaeological Sites

Eligibility Determination	Site
Eligible	CA-INY-5350H
Ineligible	CA-INY-1991/H (historical component) CA-INY-5953H CA-INY-5957H CA-INY-5958/H (historical component) CA-INY-6394H CA-INY-6395H CA-INY-6396H CA-INY-6397H CA-INY-6398H

Additionally, one long, linear historical resource is reviewed within this report: the historic transportation route that runs north-south through the Owens Valley, CA-INY-4590H (P-14-004590), known commonly as the Inyo County Wagon Road. Previous investigations on other portions of the historic route found that it is not eligible for the NRHP (Hupp 2000, Hobbs 2003). Research on the portion of the route running through the Project's APE was conducted using historical maps, articles, and monographs. As the route evolved over 170 years it acquired various common names and legislative, official, and commemorative designations. Though periods of significance with clear historical associations exist for the route in general, no historical archaeological features or remains were identified during any aspect of this investigation that can be positively linked to these periods of significance. The resource is discussed in greater detail in Chapter 5 of this report.

Participants and Observers: Perspectives on Historic Native American Information from Independence to Haiwee Reservoir in Owens Valley (Davis-King and Johnson 2003) (Appendix E) was completed to provide a comprehensive Native American historical context—including voices and perspectives from the Native American community—against which late-period and historic period archaeological sites might more comprehensively and effectively be evaluated. The report also sought to identify resources in the Olancha-Cartago area that might not be identified using standard field survey methods and served as part of Caltrans' consultation with the Native American community. One sacred area was identified within the APE by this study.

Finally, Appendix F includes a copy of the results of the records search conducted by the Eastern Information Center (RS# 2090) of the California Historic Resources Information System, housed at the University of California, Riverside. It also contains a collection of correspondence sent to individuals and organizations discussing the proposed Project and the cultural resources investigation. Appendix G includes supporting documentation from the Historic Bridge Inventory (Caltrans 2001), Archaeological Determinations of Eligibility (OHP 2000), and site records. Appendix H is a confidential appendix that includes information about sacred lands within the APE.

Chapter 2. Project Description

Caltrans, in conjunction with the FHWA and a coalition of Regional Transportation Planning Agencies, proposes improvements to US 395 as it runs through the Owens Valley of Inyo County, California. The coalition of Regional Transportation Planning Agencies includes the Inyo County Local Transportation Commission, the Mono County Local Transportation Commission, and the Kern Council of Governments, and was formed with the intent of jointly funding this and other projects along the US 395 corridor.

The southern terminus of the Project at KP 49.6 (PM 30.8) coincides with the northern terminus of the existing Sage Flat Four-Lane facility (Figure 3, Index Page and Sheets a through g). From there, the Project runs northward across the Los Angeles Aqueduct and then passes through the town of Olancha where it intersects State Route 190 (SR 190), which runs eastward. As US 395 continues north it passes through the town of Cartago, crosses the Braley Creek alluvial fan, and crosses the willow dip (a small "cove" between two alluvial fans where a short segment of the existing highway is built on the lake bed). It terminates at the north end by connecting with the existing Ash Creek Four-Lane facility at KP 67.3 (PM 41.8).

Four project alternatives are considered, three build alternatives with two design options (Alternatives 1, 2 and 3 with Design Options 2a and 3a), plus the no-build alternative. All of the build alternatives will have two 3.6-m-wide (12-ft) travel lanes and a 3-m-wide (10-ft) outside shoulder in each direction. In the all-paved section of Alternative 1 there will be a 4.2-m-wide paved center median. Along divided highway portions of the alternatives there will be 1.5-m-wide (5-ft) inside shoulders with a minimum 30.5 m (100 ft) center median. All build alternatives also will improve the intersection of US 395 and SR 190 and construct a new two-lane bridge over the Los Angeles Aqueduct 30.5 m (100 ft) west of the existing bridge. Where necessary all of the build alternatives also will improve drainage, provide cattle under-crossings, rehabilitate the existing traveled way, construct right- and left-turn lanes, and build access or frontage roads for any parcels that become land-locked as a result of the Project. The Project will run across public lands administered by the Bureau of Land Management (BLM), lands owned by the Los Angeles Department of Water and Power (LADWP) and various agencies of the State of California, and privately owned land. All of the build alternatives entail acquiring new rights-of-way

(ROW). Some of the build alternatives impact existing residences and businesses. Each alternative is discussed below from south to north.

2.1. Alternative 1

Alternative 1 proposes to construct segments of conventional all-paved four-lane highway, conventional divided four-lane highway, and controlled-access divided four-lane highway. This alternative would provide route continuity by connecting the Sage Flat Four-Lane facility at the south end of the Project with the Ash Creek Four-Lane facility at the north end.

Starting at the south end of the Project and extending north to 1.0 km (0.6 miles) south of Cactus Flat Road, a controlled-access divided four-lane highway is proposed. The existing lanes would be utilized for northbound traffic, and new southbound lanes would be constructed to the west separated by a 30.5-m-wide (100 ft) median.

From 1.0 km (0.6 miles) south of Cactus Flat Road to the junction of SR 190, a conventional all-paved four-lane highway is proposed. The existing highway would be widened to the east; northbound and southbound lanes would be separated by a 4.2-m-wide (14 ft) paved median.

Continuing north from the junction of SR 190 to 1.0 km (0.6 miles) north of Whitney Street, a conventional all-paved four-lane highway is proposed. The existing highway would be widened to the west; northbound and southbound lanes would be separated by a 4.2-m-wide (14 ft) paved median.

From 1.0 km (0.6 miles) north of Whitney Street to 3.6 km (2.2 miles) north of Whitney Street, a conventional divided four-lane highway is proposed. The existing lanes would be utilized for northbound traffic, and new southbound lanes would be constructed to the west separated by at least a 30.5-m-wide (100 ft) median.

For the last segment, from 3.6 km (2.2 miles) north of Whitney Street to the north end of the Project, a controlled-access divided four-lane highway is proposed. The existing lanes would be utilized for southbound traffic, and new northbound lanes would be constructed to the east separated by at least a 30.5-m-wide (100 ft) median.

2.2. Alternative 2

Alternative 2 proposes to construct a controlled-access divided four-lane highway with northbound and southbound lanes separated by at least a 30.5-m-wide (100 ft) median throughout. This alternative would provide route continuity by connecting the Sage Flat Four-Lane facility at the south end of the Project with the Ash Creek Four-Lane facility at the north end.

Starting at the south end of the Project and extending north to 1.7 km (1.1 miles) south of Cactus Flat Road, the existing lanes would be utilized for northbound traffic, and new southbound lanes would be constructed to the west.

From 1.7 km (1.1 miles) south of Cactus Flat Road to 0.3 km (0.2 miles) south of the junction of SR 190, new northbound and southbound lanes would be constructed to the east of the existing highway, and the existing highway would be utilized as a frontage road.

Continuing north from 0.3 km (0.2 miles) south of the junction of SR 190 to 0.4 km (0.3 miles) south of Ranch Road, new northbound and southbound lanes would be constructed to the west of the existing highway, and the existing highway would be utilized as a frontage road.

From 0.4 km (0.3 miles) south of Ranch Road to 3.6 km (2.2 miles) north of Whitney Street, the existing highway would be converted to northbound lanes and new southbound lanes would be constructed to the west.

For the last segment, from 3.6 km (2.2 miles) north of Whitney Street to the north end of the Project, the existing highway would be converted to southbound lanes and new northbound lanes would be constructed to the east.

2.3. Design Option 2A

Design Option 2A is a variation of Alternative 2 that proposes to construct a controlled-access divided four-lane highway to the west of the community of Cartago. Northbound and southbound lanes would be separated by at least a 30.5-m-wide (100 ft) median.

From the south end of the Project to 1.3 km (0.8 miles) north of the junction of SR 190, this design option is similar to Alternative 2.

Continuing north from 1.3 km (0.8 miles) north of the junction of SR 190 to 1.3 km (0.8 miles) north of Whitney Street, new northbound and southbound lanes would be constructed to the west of the community of Cartago.

From 1.3 km (0.8 miles) north of Whitney Street to the north end of the Project, this design option is similar to Alternative 2.

2.4. Alternative 3

Alternative 3 proposes to construct a controlled-access divided four-lane highway to the west of the community of Olancha with northbound and southbound lanes separated by at least a 30.5-m-wide (100 ft) median throughout. This alternative would provide route continuity by connecting the Sage Flat Four-Lane facility at the south end of the Project with the Ash Creek Four-Lane facility at the north end.

Starting at the south end of the Project and extending north to 0.8 km (0.5 miles) south of Cactus Flat Road, the existing lanes will be utilized for northbound traffic and new southbound lanes will be constructed to the west.

From 0.8 km (0.5 miles) south of Cactus Flat Road to 0.4 km (0.3 miles) south of Ranch Road, new northbound and southbound lanes would be constructed to the west of the community of Olancha. The junction with SR 190 will be extended west to connect with the new lanes.

Continuing north from 0.4 km (0.3 miles) south of Ranch Road to 3.6 km (2.2 miles) north of Whitney Street, the existing lanes will be utilized for northbound traffic and new southbound lanes will be constructed to the west.

The last segment, from 3.6 km (2.2 miles) north of Whitney Street to the north end of the Project, would convert the existing lanes to southbound lanes and new northbound lanes would be constructed to the east.

2.5. Design Option 3A

Design Option 3A is a variation of Alternative 3 that proposes to construct a controlled-access divided four-lane highway to the west of the community of Cartago. Northbound and southbound lanes would be separated by at least a 30.5-m-wide (100 ft) median throughout.

From the south end of the Project to 0.8 km (0.5 miles) south of Cactus Flat Road, this design option is similar to Alternative 3.

From 0.8 km (0.5 miles) south of Cactus Flat Road to 1.3 km (0.8 miles) north of Whitney Street, new northbound and southbound lanes would be constructed to the west of the communities of Olancha and Cartago. The junction with SR 190 would be extended to the west to connect with the new lanes.

From 1.3 km (0.8 miles) north of Whitney Street to the north end of the Project, this design option is similar to Alternative 3.

2.6. Alternative 4

Alternative 4 is the no-build alternative.

2.7. The Cultural Resources Survey Area

The cultural resources survey area was delineated to encompass the widest possible range of project alternatives (see Figure 2). The areal extent of the study area is approximately 1380 hectares (3,400 acres).

2.8. The Area of Potential Direct Effects

The Area of Potential Direct Effects (Direct APE) was delineated to encompass all foreseeable project-related, ground-disturbing construction activities for all proposed alternatives (Figure 3). In some places the Direct APE is required to be very wide—multiple alternatives and design options criss-cross these areas. The Direct APE was delineated in accordance with Attachment 3 of the Programmatic Agreement and considers areas required for the construction of the new highway; stream culverts, storm water treatments, and other drainage treatments; the installation and relocation of utilities; staging and storage areas, access and haul roads, and temporary construction easements; areas to be relinquished; and mitigation areas. Additionally, where the Direct APE encroached upon an archaeological site only partially it was adjusted to include that archaeological site in its entirety.

2.9. The Phase-2 Study Area

The Phase-2 Study Area was delineated to encompass those portions of the Direct APE where project-related, ground-disturbing construction activities could be reasonably anticipated regardless of which alternative is selected as the recommended alternative. Delineating a Phase-2 Study Area helped Caltrans avoid unnecessary damage to numerous archaeological sites within the Direct APE.

The Phase-2 Study Area was defined as a corridor running parallel with the existing highway and extending 107 m (350 ft) from each side of it, except where constrained by wetlands. The 107-m-width (350 ft) was determined by assuming that in all places the existing highway would get converted to frontage road, and, to either side, the Project would require a 30.5-m-wide (100 ft) ROW, two lanes of travel plus shoulders totaling 11.9 m (39 ft), a 30.5-m-wide (100 ft) center median, two more lanes of travel plus shoulders, and, at the far edge, 22 m (72 ft) of ROW.

As defined, this Phase-2 Study Area encompasses areas at the southern and northern portions of the Project where all alternatives are essentially the same. The Phase-2 Study Area also encompasses the entire existing alignment because it either will be disturbed by the selection of an alternative along the existing highway or, if an alternative away from the existing alignment of US 395 is selected, the existing facility will be relinquished. The State cannot relinquish facilities that do not meet current design standards to another party, and thus roadway improvements to the existing highway can be reasonably expected, even if Alternative 1 or Alternative 2 are not selected as the recommended alternative. Also, relinquishment of land as a result of a federal undertaking requires compliance with Section 106.

Regarding Alternative 3 and Design Options 2A and 3A, the Caltrans Project Development Team decided to postpone test excavations at archaeological sites along those alignments pending selection of a recommended alternative in accordance with FHWA policy and guidance set forth in the *Environmental Handbook, Volume II, Cultural Resources* (Caltrans 2001a), §2-4.1. If Alternative 3, 2A, or 3A are selected to be part of the recommended alternative, the Phase-2 Study Area will change, and evaluation studies will be undertaken at resources along the selected alignment and a supplemental HPSR will be prepared and submitted to the SHPO.

2.10. The Area of Potential Indirect Effects

The Area of Potential Indirect Effects (Indirect APE) includes the Direct APE and all buildings and structures that are adjacent to the Direct APE due to indirect effects posed by increased noise levels and alterations to the viewshed.

Chapter 3. Summary of Identification Efforts

3.1. Records Search

A cultural resources records search (RS #2090) was conducted in July 1999 at the Eastern Information Center of the California Historical Resources Information System, housed at the University of California, Riverside (Appendix F). In addition to Eastern Information Center cultural resource files, the records search consulted the National Register of Historic Places, the California Register of Historic Resources, California Points of Historical Interest, and California Historical Landmarks.

The search revealed that 11 surveys had been conducted within or on a portion of the study area. Twenty previously recorded cultural resource sites were known to exist within the survey area, 16 additional archaeological sites were known to be within a half-mile radius of the study area, and 10 additional sites had been recorded within a one-mile radius. Also, a survey of the southwest quarter of Section 18, Township 19 South, Range 37 East, San Bernardino Base Meridian, recorded 22 isolated artifacts. A listing of previously recorded sites and isolated artifacts appears on pages 11 and 12 of the *Archaeological Survey Report* (Appendix A).

3.2. Archival Research

Numerous sources were consulted to gather information on historic-era land use and development, with particular focus on transportation, settlement, commerce, and industry. These included:

- as-built maps from previous highway construction projects on file at Caltrans' District 6 and District 9 offices;
- USGS 15' and 7.5' topographic quadrangles from 1947, 1956, and 1973 on file at the Henry Madden Library, California State University, Fresno;
- files containing newspaper clippings, brochures, booklets, pamphlets, and various other types of articles about local news and history on file at the Eastern California Museum in Independence.

The *Archaeological Survey Report* presents detailed background research on the Owens Valley region on topics including the paleoenvironment, the present-day natural environment, Koso Shoshone ethnography, Owens Valley Paiute ethnography, Holocene archaeology, and various aspects of Owens Valley History. Many of these topics were further developed in the research design for excavations at prehistoric sites, including the areas of regional chronologies, subsistence strategies, and reviews of various models of settlement organization. The archaeological excavation report also devotes entire chapters to reviewing the Owens Valley paleoenvironment (Chapter 21 by R.S. Anderson) and the environmental history of Owens Lake during the Late Holocene (Chapter 19 by S. Stine).

Archival research for the development of a historic Native American context and the report *Participants and Observers: Perspectives on Historic Native American Information from Independence to Haiwee Reservoir in Owens Valley* was conducted at numerous facilities, including the Bancroft Library, the Phoebe Hearst Museum, the Eastern California Museum, the Laws Railroad Museum, Death Valley National Park, the Bureau of Land Management office in Ridgecrest, the Natural History Museum of Los Angeles County, the Yosemite Research Library, the personal library of Yosemite National Park Historian C.D. Bates, the California State Archives, the California Room of the California State Library, the National Archives Center in San Bruno, the Tulare County Library, Sequoia National Park, the Tuolomne County Library, and various facilities at the University of California at Davis. Additionally, Davis-King interviewed numerous representatives of the Native American community in the southern Owens Valley and listened to 11 tapes from the oral history tape collection housed at the Eastern California Museum.

For the *Historical Architectural Survey Report*, research was conducted at the Water Resources Center Archives and the Kresge Engineering Library at the University of California at Berkeley; the Geology, Mining, and Petroleum Room at the Beale Memorial Kern County Library; the Walter W. Stiern Memorial Library at the California State University at Bakersfield; the Eastern California Museum; and the Inyo County Assessor’s Office in Independence.

For the *Historical Studies Report* research was conducted at the Bureau of Land Management offices in Ridgecrest and Sacramento, the California State Library, the Eastern California Museum, the Inyo County Assessor’s Office, the Inyo County Recorder’s Office, the Inyo-Mono Title Company, the Los Angeles Department of Water and Power Offices in Bishop, and the Southern San Joaquin Valley Information Center at the California State University at Bakersfield.

Chapter 4. Public Participation

4.1. Local Government/Planning Department

The Inyo County Local Transportation Commission, the Mono County Local Transportation Commission, the Kern Council of Governments, and the County of Inyo Board of Supervisors are part of the Project Development Team and are active participants in the planning, development, and funding of the Project. Personnel from the Los Angles Department of Water and Power also are members of the Project Development Team.

4.2. Native American Heritage Commission

On October 6, 1999, Caltrans sent a letter to the Native American Heritage Commission requesting a search of their files to determine if any sacred sites, plant gathering locations, or traditional cultural properties were know to exist in the vicinity of the proposed Project. Ms. Debbie Pilas-Treadway of the Native American Heritage Commission returned a letter to Caltrans on October 27, 1999, stating their files failed to indicate the presence of Native American cultural resources in the immediate project area (Appendix G). The letter also included a list of six Native American individuals who may have concerns about the proposed Project or have special knowledge of cultural resources in the project vicinity.

4.3. Native American Groups

Caltrans archaeologists Christopher Ryan and Tom Mills met with and corresponded with numerous representatives of the Owens Valley Native American community on several occasions, including:

- A presentation to the Tribal Council of the Lone Pine Paiute-Shoshone Reservation;
- A presentation during a special session tribal meeting;
- A presentation to Tribal Elders;
- Communications during the course of organizing and carrying out Native American monitoring of the archaeological excavations;

- Progress reports to the Tribal Council members, Tribal Elders, and other interested tribal members (Appendix F);
- Special invitations to public information meetings;
- And, with Shelly Davis-King, communications during interviews and research inquiries with various members of the greater Owens Valley Paiute-Shoshone community in the course of producing the report *Participants and Observers: Perspectives on Historic Native American Information from Independence to Haiwee Reservoir in Owens Valley*.

Comments received from the Native American community focused on three main issues: Native American monitoring of archaeological excavations, avoiding disturbance to archaeological deposits that include Native American human remains, and curation of artifacts recovered during the course of the Project. Caltrans agreed to provide compensation to Native American monitors selected by the tribe. Regarding Native American human remains in archaeological deposits, Caltrans communicated to the Tribe that as soon as Native American human remains were encountered excavations would halt and the Native American monitor and Tribal Chair Rachel Joseph would immediately be notified for guidance on how to treat the encountered remains. Caltrans also communicated to the Tribe that Caltrans would comply with State Health and Safety Code 7050.5 and California Public Resources Code 5097.98. Additionally, Caltrans consulted BLM Archaeologist Kirk Halford on this issue with regard to federal lands and the Native American Graves Protection and Repatriation Act (NAGPRA). Halford also instructed Caltrans to avoid disturbance to archaeological deposits that included Native American human remains.

Regarding curation of artifacts recovered during the course of the Project, the Tribal Council of the Lone Pine Paiute-Shoshone Reservation strongly objected to permanent curation of the artifacts in a facility outside of the Owens Valley. Caltrans learned that the General Management Plan for the Manzanar National Historic Site calls for the establishment of a curation facility to house materials relating to Manzanar as well as materials from other cultural resource sites throughout Owens Valley. The facility will be constructed by the National Park Service on lands administered by the Eastern California Museum in Independence. Once built, the facility will be managed by museum personnel. Although meetings discussing the curation facility have occurred, no construction timeline has been established. Regardless, Caltrans has agreed to curate the artifacts from the Olancha/Cartago

Four-Lane Project at the Owens Valley curation facility. In the interim, the artifacts are curated at the facility located at the California State University, Bakersfield.

Lastly, Native American consultation resulted in the identification of one sacred area along the western edge of the town of Cartago, which was recorded on a sacred lands form and incorporated into the sacred lands files maintained by the Native American Heritage Commission. A Tribal Elder from the Lone Pine Paiute-Shoshone Reservation escorted Shelly Davis-King to the sacred area in August 2002. The area, situated on land administered by the California State Lands Commission, is partly within the undertaking's APE, and if Alternative 2A or 3A are selected to be part of the recommended alternative, potential project effects upon the sacred area will need to be considered. Other details about this sacred area and two other sacred areas encountered during archaeological excavations are presented in a confidential appendix that will be included with copies of this report that are submitted to the FHWA, SHPO, and other Federal and State agencies as appropriate, but excluded from publicly circulated copies.

4.4. Local Historical Society

The Eastern California Museum in Independence was consulted frequently throughout the effort to identify historic properties within the Project's APE. Museum Historian and Curator Beth Porter provided valuable assistance to numerous researchers wishing to examine museum resources including historic photographs and maps, rare books and local publications, and the museum's oral history recordings. Ms. Porter also reviewed drafts of the Archaeological Survey Report, the research designs for the evaluation of prehistoric and historical archaeological sites, the archaeological excavation report, the Historical Study Report, and the report on historic Native American information.

Ms. Porter revealed that a local publication entitled *The Cemeteries of Inyo County* includes an interview with an elderly man who grew up in Cartago and recalls that there once was a cemetery for the victims of the 1918 influenza pandemic in the vicinity of Cartago. In the publication, the elderly man states that the grave markers were all made of wood and had long since deteriorated and that he did not remember the location of the cemetery. Even though cemeteries are ordinarily not considered eligible for the NRHP, several attempts were made to find the cemetery. The cemetery was not found during surface surveys and not encountered during any of the archaeological excavations. The cemetery and cautionary measures will be described in a document entitled *Special Provisions*, a construction contract management document that supplements the *Standard Specifications* manual and is distributed to all construction management personnel. These measures will include compliance with State Health and Safety Code 7050.5 and California Public Resources Code 5097.98.

4.5. Public Information Meetings

Two public information meetings were held to present Project alternatives and other information to interested citizens. Both were held at the Olancha School in Olancha. The first occurred on April 10, 2000, the second on July 25, 2002. No cultural resources concerns were raised during either of the meetings.

Chapter 5. Resources Identified

There are 175 cultural resources within the APE for the proposed Olancha/Cartago Four-Lane Project (two archaeological sites, CA-INY-1991/H and -5958/H, are dual component sites that required a determination of eligibility for each component, thus counting as four individual resources). Seventy-one of these resources meet the criteria for Attachment 4 of the Programmatic Agreement, Properties Exempt from Evaluation. The evaluation of 38 other resources was postponed until the selection of a recommended alternative in order to avoid unnecessary damage to these resources. Of the remaining 66 resources, seven had already been evaluated for the NRHP and 59 were formally evaluated for this Project (Table 5-1). Of the seven previously evaluated resources, archaeological excavations took place at two NRHP eligible sites to determine whether deposits contributing to their eligibility existed within the Phase-2 Study Area. A segment of one historic road that runs through the APE also was evaluated; other segments of this road have been found ineligible for the NRHP. In sum, this report requests SHPO concurrence with 62 determinations.

The 71 exempt resources include 22 isolated artifacts and 49 built environment resources. Caltrans Architectural Historian Chris Brewer (PQS, Principal Architectural Historian) reviewed the Project's APE and confirmed that the 49 architectural resources and all other built-environment resources within the APE meet the criteria for Attachment 4 of the Programmatic Agreement.

Table 5-1: Number of Evaluated Resources by Type and Eligibility

Resource Type	Eligible		Ineligible		Total
	Determined Previously	Determined Herein	Determined Previously	Determined Herein	
Prehistoric Archaeological	2	5	2	8	17
Historical Archaeological	---	1	---	9	10
Built Environment	---	1	3	35	39
Subtotal	2	7	5	52	66
Total	9		57		

5.1. Resources Previously Determined Eligible

Two prehistoric archaeological sites within the undertaking's APE were determined eligible for the NRHP prior to the current study (Table 5-2).

Table 5-2: Resources Previously Determined Eligible for the NRHP

Name	Location	Community	Map Reference
CA-INY-0043	[redacted]	[redacted]	43
CA-INY-1317	[redacted]	[redacted]	1317

CA-INY-43 (Map Reference #43)

CA-INY-43 is a prehistoric site found eligible for the NRHP under Criterion D by consensus determination between the BLM and SHPO on November 13, 1992 (Appendix G). The western edge of the Phase-2 Study Area overlaps the eastern edge of the site. Because no excavations had ever been conducted in this portion of the site, excavations were conducted within the overlap area to determine whether it contains archaeological deposits that contribute to the site's eligibility. For details of the investigation, please refer to Appendix B, Chapter 10, beginning on page 253.

This report requests concurrence that the portion of CA-INY-43 that overlaps the Phase-2 Study Area does not contain deposits that contribute to the site's eligibility under Criterion D or meet any of the other criteria of significance. Similarly, the portion of CA-INY-43 that overlaps the Phase-2 Study Area does not contain deposits that constitute a historic resource for the purposes of CEQA.

CA-INY-1317 (#1317)

CA-INY-1317 is a prehistoric site originally recorded as six separate sites scattered across a dissected alluvial fan: CA-INY-1317, -1318, -3807, -3808, -3809, and -3810 (Burton 1990). Three of these were found eligible by consensus determination between the BLM and the SHPO on April 16, 1991: CA-INY-3807, -3809, and -3810 (see Delacorte and McGuire 1993) (Appendix G). During a 1992 survey archaeologists decided there was no clear break in the distribution of artifacts across the alluvial fan and the six sites were combined under a single trinomial, CA-INY-1317 (Berg 1992). The request to de-list the five remaining trinomials, including those for the three eligible sites, was approved by the Eastern Information Center and the records for those five sites were stamped CA-INY-1317. Thus, CA-INY-1317 contains archaeological deposits that were determined eligible for the NRHP.

The Phase-2 Study Area bisects CA-INY-1317. Because no excavations had ever been conducted where CA-INY-1317 and the Phase-2 Study Area overlap, excavations were conducted in that area to determine whether it contains deposits that contribute to the site's eligibility. Excavations also were conducted throughout Locus 3 to obtain an understanding of the unique remains visible on the ground surface, and thus a more complete understanding of the site as a whole. For details of the investigation, please refer to Appendix B, Chapter 5, beginning on page 71.

This report requests concurrence from the SHPO that the portion of CA-INY-1317 that overlaps the Phase-2 Study Area appears to contain deposits that contribute to the site's NRHP eligibility under Criterion D. Similarly, the portion of CA-INY-1317 that overlaps the Phase-2 Study Area does contain deposits that constitute a historic resource for the purposes of CEQA.

5.2. Resources Determined Eligible

Seven resources within the undertaking's APE were determined eligible for the NRHP as a result of this historic property survey: five prehistoric sites, one historical archaeological site, and one building (Table 5-3).

Table 5-3: Resources Determined Eligible for the NRHP

Name	Location	Community	Map Reference
CA-INY-1991/H [1,3]	[redacted]	[redacted]	1991/H
CA-INY-5967			5967
CA-INY-5984			5984
CA-INY-6021			6021
CA-INY-6263			6263
CA-INY-5350H			5350H
Olancha Schoolhouse	APN 33-080-07		19

[1] Prehistoric component

[3] Portion of site not excavated due to denied access

This report requests concurrence that the following five prehistoric archaeological sites are eligible for the NRHP under Criterion D due to their potential to contribute to a greater understanding of prehistory in the southern Owens Valley. These resources also constitute historic resources for the purposes of CEQA:

CA-INY-1991/H, Prehistoric Component (#1991/H)

CA-INY-1991 is a large prehistoric site with surface and near-surface remains that date to the Marana period: two radiocarbon dates from a hearth feature calibrate to AD 1500 to 1645 and AD 1425 to 1615. A deeply buried deposit measuring approximately 20 x 20 m also was encountered, yielding flaked stone tools and debitage, faunal remains, charcoal, and a radiocarbon date that calibrates to 4730 to 4685 BC, placing the occupation in the Pinto period. The northernmost 200 meters of the site is on a private parcel for which Caltrans did not receive permission to conduct excavations. Also, the western site boundary was not delineated because it extended well beyond the Phase-2 Study Area. For details of the investigation, please refer to Appendix B, Chapter 12, beginning on page 285.

CA-INY-5967 (#5967)

CA-INY-5967 is a prehistoric site with preserved subsurface midden deposits in a 60-x-20-meter area in the southern portion of the site. Artifacts recovered include projectile points and other bifaces, retouched flakes, debitage, ground stone, and a bone awl. A buried hearth dates to the middle of the Newberry period (AD 245 to 520, calibrated). Three Rose Spring points recovered from the surface indicate a Haiwee period occupation also exists. Despite a variety of modern impacts the midden area appears to be well preserved. Data from the site will yield information about Newberry and Haiwee period occupations. For details of the investigation, please refer to Appendix B, Chapter 8, beginning on page 207.

CA-INY-5984 (#5984)

CA-INY-5984 is a prehistoric site with bedrock milling features and two spatially distinct subsurface deposits. The northern deposit extends 110 x 30 meters and has a house floor and associated hearth. Two radiocarbon samples dating (calibrated) to AD 1250 and Rose Spring projectile points on the surface indicate a Haiwee Period occupation. The deposit in the central portion of the site covers a 30-meter-diameter area and is a dark gray midden with high quantities of artifacts and faunal remains. Elko projectile points indicate a Newberry period occupation. A surface scatter of pottery and glass beads in the southern portion of the site indicates a Marana or Historic period occupation. The two midden deposits are well preserved. For details of the investigation, please refer to Appendix B, Chapter 9, beginning on page 229.

CA-INY-6021 (#6021)

CA-INY-6021 is a prehistoric site with a well-preserved Newberry Period midden within the western half of the site with a house floor that was radiocarbon dated (calibrated) to between 55 B.C. and A.D. 120. A hearth was radiocarbon dated (calibrated) to A.D. 530 to 600. Associated subsurface artifacts include a Humboldt Basal-notched point and other bifaces, retouched flakes, debitage, a bone awl, a shell bead, and a relatively large amount of faunal remains. A smaller midden lies east of the Phase-2 Study Area near the power line and was not tested during this Project. That midden was tested previously by Jim Nelson of Jones and Stokes, Inc., Sacramento[redacted] Native American representatives from the Lone Pine Paiute-Shoshone Tribe requested no further disturbances to the eastern midden area. The site has been impacted by a variety of modern disturbances, particularly near the highway, but extensive portions of the subsurface deposit are well preserved. For details of the investigation, please refer to Appendix B, Chapter 7, beginning on page 183.

CA-INY-6263 (#6263)

CA-INY-6263 is a prehistoric site with milling features and two spatially distinct components. One midden in the southwestern portion of the site includes three rock rings on the surface and a substantial subsurface deposit. This midden, although undated, contained a Humboldt basal-notched point in a subsurface context suggesting a Newberry Period occupation. Bioturbation is moderate and modern disturbance is limited. The second cultural deposit is a dark gray midden extending for 120 x 50 meters. Although testing was limited because most of this area is outside the Phase-2 Study Area, a radiocarbon date (calibrated) of A.D. 390 to A.D. 435 from the center of this midden places occupation in the late Newberry Period. Four Rose Spring points from buried contexts within the south-central portion suggest a Haiwee period occupation as well. This eastern midden has been impacted by more extensive modern disturbance but appears to have portions that retain integrity. For details of the investigation, please refer to Appendix B, Chapter 6, beginning on page 151.

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This report requests concurrence that the following historical archaeological site is eligible for the NRHP under Criterion D due to its potential to contribute to a greater understanding of early settlement and the history of soda ash mining in the southern Owens Valley. Specifically, Features 1 and 6 meet the NRHP criteria of eligibility, and they constitute historic resources for the purposes of CEQA. Other areas within the boundary of CA-INY-5350H (Features 2, 3, 4, 5, 7, and 8) do not contribute to the site's eligibility under Criterion D, and they do not constitute historic resources for the purposes of CEQA.

CA-INY-5350H (#5350H)

CA-INY-5350H is a dumping ground used by the residents of the town associated with the mining operations at Cartago and more recently by Cartago residents. The earliest remains observed come from the 1890s, a time when ranching was the principal occupation in the area. In 1917 the California Alkali Company opened a soda ash plant at Cartago, which operated until 1921. In 1924, the Inyo Chemical Company acquired and reopened the plant, operating it until 1932. The dump site measures approximately 680 ft. north-south by 260 ft. east-west and contains eight distinct clusters of dumping refuse (features) from different time periods. Feature 1 is composed of food storage vessels and table wares from the 1910s to 1920s. There are also large sanitary cans. Feature 6 is composed of food-storage containers and tablewares dating from the 1890s to 1950s. The other six features date to the 1960s and later, and are not historic.

Feature 1 and Feature 6 have a sufficient quantity and variety of historical archaeological remains that retain integrity (i.e., they represent distinct episodes of dumping that can be associated with a specific group of people). As such, Features 1 and 6 have the potential to address research questions regarding domestic life in the organized mining company town and the early years of the town of Cartago. Research domains include consumer patterns, dietary patterns, and other daily life and social issues. For details of the investigation, please refer to Appendix D, sections 6.3 and 7.2, beginning on pages 31 and 51, respectively.

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This report requests concurrence that the following architectural resource is eligible for the NRHP at the local level of significance under Criterion A because it was the first formal schoolhouse in the community and played an important role in the social and educational history of the town. Similarly, the schoolhouse constitutes a historic resource for the purposes of CEQA. None of the other structures are contributing elements, nor do they constitute historic resources for the purposes of CEQA.

The Olancha Schoolhouse (#19)

The Olancha Schoolhouse is a rectangular-plan wood frame building with a gable roof. A small belfry housing the original school bell is located on the roof just above the gable on the façade. A shed roof porch projects from the façade to cover the main entrance. The Olancha Elementary School District was formed in 1910. School operated out of a private residence until George Brown donated land for the construction of this schoolhouse. Completed in 1914, it was a typical one-room country school with one teacher responsible for instructing several children in grades ranging from kindergarten to eighth grade. The school also served as the public meeting place for social events. In 1945 the Olancha Unified School District consolidated the Olancha and Cartago Elementary School Districts. The Cartago School closed and the students attended the Olancha School. In 1949 a new, multiple-room elementary school was completed at the corner of Shop Street and School Road, and the old schoolhouse passed into private ownership. It currently serves as a woodworking shop. It has undergone some minor alteration such as the decorative shutters applied to the windows on the façade, and the replacement of some windows. A pump house, storage shed, and carport were added to the property between 1965 and 1970. For details of the investigation, please refer to Appendix C, Inventory Forms, Map Reference No. 19.

5.3. Resources Previously Determined Ineligible

Five resources within the undertaking's APE were found ineligible for the NRHP prior to this historic property survey (Table 5-4.). These resources also do not constitute historic resources for the purposes of CEQA.

Table 5-4: Resources Previously Determined Ineligible for the NRHP

Name	Location	Community	Map Reference Number
CA-INY-0291/H	[redacted]	[redacted]	291/H
CA-INY-0371	[redacted]	[redacted]	371
CA-INY-4607H	Inyo County	Inyo County	38
CA-INY-4590H	Inyo County	Inyo County	4590H
Bridge 48-0010 (P-14-4870)	[redacted]	[redacted]	1

CA-INY-0291/H (#291/H)

CA-INY-291/H was tested by Delacorte and McGuire (1993) and found ineligible by consensus determination between the BLM and the SHPO on April 16, 1991.

CA-INY-0371 (#371)

CA-INY-0371 was tested by Delacorte and McGuire (1993) and found ineligible by consensus determination between the BLM and the SHPO on April 16, 1991.

CA-INY-4607H (#38)

CA-INY-4607H, the grade for the former Mojave-Owenyo Branch of the Southern Pacific Railroad, was found ineligible by the SHPO on March 8, 1995.

CA-INY-4590H (#4590H)

CA-INY-4590H is the remains of a historic transportation route that runs north-south through Owens Valley. Research on the segment of the route running through the project area was conducted using historical maps, articles, and monographs. As the route evolved over 170 years it acquired various historical associations, as well as common names and legislative, official, and commemorative designations.

The route was first found ineligible by consensus determination between the FHWA and the SHPO on January 25, 1995. Subsequent investigations on other segments of the historic route also found that it is not eligible for the NRHP. On behalf of the FHWA, Caltrans found the segment of the Inyo County Wagon Road in the vicinity of Fish Springs, Aberdeen-Blackrock, Independence, Manzanar, and the Alabama Gates to be ineligible (Hupp 2000). The SHPO concurred with this finding in December 2002 (Appendix F). Also on behalf of the FHWA, Caltrans found segments of Legislative Route Number 23 and the Midland Trail in the vicinity of Little Lake to be ineligible (Hobbs 2003). On January 21, 2004, the SHPO concurred with this finding (Appendix F).

Research conducted for this Project revealed that CA-INY-4590H possesses a historical association not considered during previous evaluations. In the vicinity of the project area the historic transportation route was used by Remi Nadeau’s 14-mule-team wagon trains for the transport of silver bullion between the mines of Cerro Gordo and the ports at El Pueblo de Los Angeles, and general merchandise upon return. This commerce was directly responsible for the first economic boom of El Pueblo de Los Angeles (Faull and Hangan 2001, Likes and Day 1975, Nadeau 1948). Although previously unrecorded segments of CA-INY-4590H were identified in the field, no maps were located demonstrating conclusively that these segments were used by the famous wagon trains. Sources consulted include the Eastern California Museum in Independence; the Map Library at the Henry Madden Library, California State University, Fresno; the David Rumsey historic map collection on the internet; Historian Mark Faull of Redrocks Canyon State Park; Avocational Historian Lou Pracchia of the Historical Society of the Upper Mojave Desert; and Historian Remi Nadeau III, great great grandson of the famous teamster. In the course of their research, Shelley Davis-King and Scott Baxter also did not find maps showing the route used by Remi Nadeau's wagon trains. A site record update for this resource is included in Appendix H.

Though a period of significance with clear historical associations exists for the route as it passes through the Project's APE, no historical archaeological features or remains were identified during any aspect of this investigation that can be positively linked to this period of significance.

Bridge 48-0010 (#1)

Bridge #48-0010 spanning the Los Angeles Aqueduct was evaluated as a Category 5 bridge in the 1986 Caltrans Historic Highway Bridge Inventory and determined ineligible for the NRHP (Caltrans 2001b).

5.4. Resources Determined Ineligible

Seventeen prehistoric and historical archaeological sites within the Project's APE were determined ineligible for the NRHP by this historic property survey (Table 5-5).

Table 5-5: Archaeological Resources Determined Ineligible for the NRHP

Name	Location	Community	Map Reference
CA-INY-290	[redacted]	[redacted]	290
CA-INY-1991/H	[redacted]	[redacted]	1991/H
CA-INY-4837	[redacted]	[redacted]	4837
CA-INY-5953H	[redacted]	[redacted]	5953H
CA-INY-5956	[redacted]	[redacted]	5956
CA-INY-5957H	[redacted]	[redacted]	5957H
CA-INY-5958 [1]	[redacted]	[redacted]	5958/H
CA-INY-5958/H [2]	[redacted]	[redacted]	5958/H
CA-INY-5964	[redacted]	[redacted]	5964
CA-INY-5966	[redacted]	[redacted]	5966
CA-INY-5981	[redacted]	[redacted]	5981
CA-INY-5990 [3]	[redacted]	[redacted]	5990
CA-INY-6394H	[redacted]	[redacted]	6394H
CA-INY-6395H	[redacted]	[redacted]	6395H
CA-INY-6396H	[redacted]	[redacted]	6396H
CA-INY-6397H	[redacted]	[redacted]	6397H
CA-INY-6398H	[redacted]	[redacted]	6398H

[1] Prehistoric component
[2] Historical component
[3] Portion of site not excavated due to denied access: evaluation incomplete

This HPSR requests concurrence that the following 17 archaeological sites do not meet any of the NRHP criteria of significance and thus are ineligible for the NRHP, nor do they constitute historic resources for the purposes of CEQA:

CA-INY-290 (#290)

CA-INY-290 is a low-density artifact scatter with eight milling features amidst a boulder-covered portion [redacted] alluvial fan. Artifacts recovered include projectile points and other bifaces, retouched flakes, and debitage. No anthropogenic sediments, charcoal, or features were identified. Most of the artifacts recovered during excavations derived from the upper 20 cm. No temporally sensitive artifacts were recovered from subsurface contexts, but projectile points collected from the surface indicate that the site was occupied during the Haiwee and Marana periods. Additional excavations at the site are unlikely to provide substantive data. For details of the investigation, please refer to Appendix B, Chapter 4, beginning on page 49.

CA-INY-1991/H, Historical Component (#1991/H)

CA-INY-1991/H is a dual component site. The historical component is limited to a sparse can and glass scatter that appears to be the result of random discard by travelers on US 395. The materials generally are not older than 50 years and cannot be associated with a specific context or group of people. For details of the investigation, please refer to Appendix D, sections 6.1 and 7.1, beginning on pages 27 and 51, respectively.

CA-INY-4837 (#4837)

CA-INY-4837 is a very low-density artifact scatter. Fieldwork at the site recovered only 32 artifacts, including 3 bifaces, 2 retouched flakes, 1 milling slab, and 26 pieces of debitage. The site lacks a subsurface deposit. Additional fieldwork would not yield substantive data. For details of the investigation, please refer to Appendix B, Chapter 17, beginning on page 407.

CA-INY-5953H (#5953H)

CA-INY-5953H is the Barney Sears homestead site. Sears patented the land in 1917 under the Homestead Act and lived there until 1927. He raised goats and later ran pack trains for tourists up the eastern side of the Sierra Nevada, helping to introduce the tourist economy that now supports the Owens Valley. Sears was well known locally during the first half of the 20th century, and is mentioned in two historical texts (Pipkin 1974:35-36; Olsen 1997:96-97,108) and the *Los Angeles Times*

(Shepard 1964). After 1927 the property was bought and sold by several other owners.

Three features comprise the site: a rectangular rock alignment, a depression in the sand, and a scatter of domestic refuse dating to between the late 1910s to the 1940s. A test excavation unit in the depression area (Feature 2) encountered domestic refuse, wood, metal cable, and a layer of tar and of ash. Few temporally diagnostic artifacts were recovered from the excavation unit, and the origin and function of the deposit is unclear. The Historic Study Report states that the relevant research domains for homestead sites include settlement patterns, land use, domestic patterns, and ranching technology. Following analysis, Baxter and Allen (2003) concluded that CA-INY-5953H appears to be eligible for the NRHP under Criterion D for its potential to yield information to address research questions regarding the lifeways of homesteaders in the southern Owens Valley. For details of the investigation, please refer to Appendix D, sections 6.4 and 7.3, beginning on pages 33 and 52, respectively.

After reviewing the draft Historic Study Report, Caltrans Archaeologist Christopher Ryan provided Past Forward with comments regarding the eligibility recommendation for CA-INY-5953H. Comments regarding significance centered on whether artifacts were present in sufficient quantity, variety, and good condition, and whether those artifacts could provide information to answer important research questions about homesteading in Owens Valley. Surface observations and excavations did not appear to demonstrate conclusively that significant deposits were present, and the analysis did not appear to demonstrate that the artifacts recovered could be linked to important research questions. Regarding integrity of association, the remains appeared to lack clear, direct connections with one historic period, or one occupant, or one type of occupation (e.g., homesteading versus simple habitation by subsequent owners).

The final Historic Study Report was sent to Caltrans Headquarters for review. Historical Archaeologist Judy Tordoff commented that the artifact collection from CA-INY-5953H is limited in its potential to address important questions within the stated research domains. Additionally, the excavations failed to generate hypotheses about homesteading that could be tested or expanded upon in a data recovery investigation. Tordoff observed that the eligibility recommendation appeared to be based on the test excavation unit in Feature 2. Although the report stated that the feature was stratified with a charcoal layer and an ash layer in pit fill, it was unclear as to what, if any, artifacts were recovered from those layers and what, if any, artifacts in the deposit were burned. Tordoff noted that the Parker's Quink bottle in the 0-4" level dates to post-1931 and the pull-tab in the 12-16" level dates to post-1960. Also, the artifact collection does not seem to form a particularly informative collection, including only one personal item, a plastic comb. Out of the 77 catalog entries for Feature 2, 92 percent of the entries are items in poor condition. This, combined with multiple site occupants, suggests that the collection has limited interpretive value.

In sum, the artifact collection from CA-INY-5953H is limited in its potential to address important questions within the stated research domains. Additionally, excavations failed to generate hypotheses about homesteading that could be tested or expanded upon in a data recovery investigation.

CA-INY-5956 (#5956)

CA-INY-5956 is a boulder hosting one milling slick. One flake was observed on the surface and one flake was recovered from the STP excavations. The milling surface was carefully examined for use-wear patterning, and none could be conclusively identified. For details of the investigation, please refer to Appendix B, Chapter 18, beginning on page 415.

CA-INY-5957H (#5957H)

CA-INY-5957H is a small scatter of modern household and automotive refuse that dates to the 1960s at the earliest. For details of the investigation, please refer to Appendix D, sections 6.5 and 7.4, beginning on pages 39 and 54, respectively.

CA-INY-5958/H, Prehistoric and Historical Components (#5958/H)

CA-INY-5958/H is a dual component site. The prehistoric component is a low-density lithic scatter. Two temporally diagnostic artifacts were collected from the surface—a Paleoindian concave base point and a Humboldt basal-notched point—but excavations indicated a very low quantity of subsurface material. Few formed artifacts and ecofacts were recovered from the excavation units and no intact subsurface cultural deposits were encountered. The subsurface sediments were dominated by unconsolidated sands hosting a few artifacts transported downward by post-depositional processes. For details of the prehistoric component investigation, please refer to Appendix B, Chapter 16, beginning on page 389.

The historical component, the [redacted] homestead site, is located within the western portion of the prehistoric component. Haden patented 160 acres in 1916 under the Homestead Act and lived there until 1947. After 1947 the property was bought and sold by several other owners, and eventually broken into several smaller parcels. Three features comprise the site. Feature 1 is a large depression 15 ft wide and 2 ft deep, and Features 3 and 4 are rectangular rock alignments of dry-laid native stone, one course high (excavations at Feature 2 indicated it was a fire ring of recent origin). A 6-ft-deep test unit at Feature 1 recovered nails, bolts, milled wood, ceramics, cans, textile fragments, and coal. At Feature 3, a test unit revealed the foundation extended only a few inches below the ground surface, and no artifacts were recovered. Three shovel test pits were excavated in artifact concentrations at various locations at the site; no artifacts were recovered from subsurface contexts. Artifacts on the surface include ceramics, bottle glass, automobile parts, wire nails, and milled wood. Diagnostic artifacts date from the 1890s to the 1930s. The Historic Study Report states that the relevant research domains for homestead sites include settlement patterns, land use, domestic patterns, and ranching technology. Following analysis, Baxter and Allen (2003) concluded that the historical component of CA-INY-5958/H appears to be eligible for the NRHP under Criterion D for its potential to yield information to address research questions regarding the lifeways of homesteaders in the southern Owens Valley. For details of the historical component investigation, please refer to Appendix D, sections 6.6 and 7.5, beginning on pages 39 and 54, respectively.

After reviewing the draft Historic Study Report, Caltrans Archaeologist Christopher Ryan provided Past Forward with comments regarding the eligibility recommendation for CA-INY-5958/H. Comments regarding significance centered on whether artifacts were present in sufficient quantity, variety, and good condition, and whether those artifacts could provide information to answer important research questions about homesteading in Owens Valley. Surface observations and excavations did not appear to demonstrate conclusively that significant deposits were present, and the analysis did not appear to demonstrate that the artifacts recovered could be linked to important research questions.

The final Historic Study Report was sent to Caltrans Headquarters for review. Historical Archaeologist Judy Tordoff raised questions about the eligibility of the Haden homestead site that were similar to those raised about the Sears homestead site. Tordoff observed that although the test unit excavated at Feature 1 encountered several charcoal layers it was not clear whether materials associated with the charcoal strata were burned. Additionally, the report lacked a thorough discussion of the specific artifacts and the details of those artifacts that date the deposit to Haden's occupation of the site rather than from all site occupants. The report was unclear as to whether the materials from CA-INY-5958/H were in good enough condition to be used for analytical purposes, and whether they were present in sufficient quantity and variety. Research themes as presented in the Historic Study Report include settlement patterns, land use, domestic patterns, and ranching technology, but the report lacks a discussion on how these materials might contribute to addressing questions within those identified themes. Also, the issue of whether the site layout is a good example of an eastern Sierra Nevada homestead goes unaddressed, thus averting the issues of ranching technology and land use.

Tordoff stated that the analysis of artifacts from the site should have generated hypotheses regarding how information from the site could help with stated research questions, hypotheses which could be tested or expanded upon during data recovery. One of the most likely questions would be "How did domestic patterns such as dietary or consumer patterns change over time?" Tordoff also was interested in whether the artifacts in the collection lend themselves to comparison with collections from other homesteads in the area. And in comparing those collections, whether the site has the potential to expand upon existing knowledge. If so, then that should be clearly demonstrated and presented as part of the eligibility argument. Tordoff did not believe that the collection permitted these types of analyses and comparisons.

In sum, the artifact collection from CA-INY-5958/H is limited in its potential to address important questions within the stated research domains. Additionally, excavations failed to generate hypotheses about homesteading that could be tested or expanded upon in a data recovery investigation.

CA-INY-5964 (#5964)

CA-INY-5964 is a low-density lithic scatter that includes one formed tool. The site lies within a former agricultural field, and the effects of plowing are visible to approximately 30 cm below surface. For details of the investigation, please refer to Appendix B, Chapter 15, beginning on page 377.

CA-INY-5966 (#5966)

CA-INY-5966 is a low-density scatter with one hearth feature on the surface. Only 58 artifacts were recovered, including one projectile point, bifaces, retouched flakes, debitage, ground stone, and pottery sherds. The Rose Spring point fragment and the ceramics suggest a late Haiwee period or possibly a Marana period occupation. This site lacks subsurface remains and the southern portion has been extensively disturbed by excavation of a massive shallow pit that is presently used as a dumping area. For details of the investigation, please refer to Appendix B, Chapter 14, beginning on page 365.

CA-INY-5981 (#5981)

CA-INY-5981 is a low-density surface scatter lacking diagnostic artifacts, and subsurface testing produced only 42 artifacts (41 debitage and 1 retouched flake), no cultural deposit, and no features. The site also has been greatly impacted by modern activities. For details of the investigation, please refer to Appendix B, Chapter 13, beginning on page 355.

CA-INY-5990 (#5990)

CA-INY-5990 is an artifact scatter with bedrock milling features. Testing at CA-INY-5990 was limited to the northern three-quarters of the site; permission to enter the private property hosting the remainder of the site was not granted. Approximately 75 percent of the modest assemblage came from the surface, and anthropogenic sediments were lacking. Temporally sensitive artifacts include one ceramic sherd and 11 glass bead fragments recovered from the surface indicating Historic period occupation. Cultural material was concentrated in the central portion of the site, while bedrock milling features (primarily slicks) were clustered in the southwest portion. Additional fieldwork within the tested portion would not yield substantive data. For details of the investigation, please refer to Appendix B, Chapter 11, beginning on page 267. Testing the southern portion of the site will be conducted as necessary upon selection of a recommended alternative. Findings will be presented in a separate and supplemental HPSR.

CA-INY-6394H (#6394H)

This resource is a ditch, the exact function and date of construction of which is unknown, although it was probably built prior to 1913. The ditch lacks any clear association with events that have made a significant contribution to the broad patterns of history, or association with the lives of persons significant to our past, and it is not a unique or distinctive system. For details of the investigation, please refer to Appendix D, sections 6.7 and 7.6, beginning on pages 44 and 54, respectively.

CA-INY-6395H (#6395H)

This resource is a rock wall, the exact function and date of construction of which is unknown, although it was likely built prior to 1913. The resource lacks any clear association with events that have made a significant contribution to the broad patterns of history, or association with the lives of persons significant to our past, and it is not a unique or distinctive system. For details of the investigation, please refer to Appendix D, sections 6.8 and 7.6, beginning on pages 46 and 54, respectively.

CA-INY-6396H (#6396H)

This resource is the remains of a railroad spur constructed to connect the California Alkali Company to the Mojave-Owenyo Branch of the Southern Pacific Railroad. The rails, ties, and bridge beams have all been removed. The Mojave-Owenyo Branch Line of the SPRR has already been evaluated as ineligible for the National Register (Mikesell 1992), and the California Alkali Company facility was found ineligible for the California Register of Historic Places (Fernandez 2002). For details of the investigation, please refer to Appendix D, sections 6.9 and 7.7, beginning on pages 46 and 55, respectively.

CA-INY-6397H (#6397H)

CA-INY-6397H is an extensive ditch running north [redacted]. Exactly when this ditch was built, by whom, and for what purpose, is unknown at this time. The ditch cannot be found on historic maps of the area, and lacks any clear association with events that have made a significant contribution to the broad patterns of history, or the lives of persons significant in our past, and there is nothing distinctive about its construction or design. For details of the investigation, please refer to Appendix D, sections 6.10 and 7.8, beginning on pages 46 and 55, respectively.

CA-INY-6398H (#6398H)

This resource is a multi-branched ditch system running west [redacted] Based on land ownership information and construction methodology, it is assumed that the [redacted] family built the ditch sometime in the late 19th century. The [redacted] bought land in Olancha as early as 1878, and have been in the area since that time. Although currently owned by the Los Angeles Department of Water and Power, the ditch is still in use by the [redacted] family. The ditch has been updated and improved with modern materials and thus has the appearance of a modern facility. The ditch lacks any obvious association with events that have made a significant contribution to the broad patterns of history, is not associated with significant persons in the past, and it is of ordinary construction. For details of the investigation, please refer to Appendix D, sections 6.11 and 7.9, beginning on pages 46 and 55, respectively.

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35 built environment resources within the undertaking's APE were determined ineligible for the NRHP as a result of this historic property survey (Table 5-6).

Table 5-6: Built Environment Resources Determined Ineligible

Name	Location	Community	Map Reference
Segment of CA-INY-4591H	Inyo County	[redacted]	2
Rustic Motel	APN 33-120-04	[redacted]	3
Olancha RV Park	APN 33-410-00A	[redacted]	4
Ed Roman House	APN 33-110-25	[redacted]	5
Olancha BLM Fire Sta.	APN 33-480-05A	[redacted]	6
Ranch Motel	APN 33-480-01,02,03, 04	[redacted]	7
Grant Service Station	APN 33-490-01	[redacted]	8
Grant Garage & Store	APN 33-110-41	[redacted]	9
Mobil Station	APN 33-100-08	[redacted]	10
Castner Service Station	APN 33-460-18	[redacted]	11
Still Life Café	APN 33-460-18	[redacted]	12
Raper House	Fall Road, APN 33-100-19	[redacted]	13
Braun House	Shop Street, APN33-100-07	[redacted]	14
Inyo County Road Dept.	Shop Street, APN 33-090-02A	[redacted]	15
Cantlay House	Fall Road, APN 33-090-20	[redacted]	16
Ness/Bellamak House	Fall Road, APN 33-090-29	[redacted]	17
Olancha School	School Street	[redacted]	18
Calloway Motel & Store	APN 33-080-03	[redacted]	20
Olancha Post Office	APN 33-080-15	[redacted]	21
Food Mart	APN 33-080-14	[redacted]	22
Spainhower Anchor Ranch	APN 33-080-34	[redacted]	23
Lone Pine School District House	APN 33-080-32	[redacted]	24
Rancho Olancha	APN 33-080-33	[redacted]	25
Ranch House Café	APN 33-080-27F	[redacted]	26
Jot-em Down Store	APN 33-080-27B	[redacted]	27
Associate Oil Station	APN 33-080-27E	[redacted]	28
Lacey Ranch	APN 33-080-27B	[redacted]	29
Mayfield House	Lacey Lane, APN 33-080-22	[redacted]	30
Cabin Bar Café	APN 33-020-02	[redacted]	31
Cabin Bar Ranch	APN 33-020-11	[redacted]	32
House 1 S of Lake St.	APN 29-200-26	[redacted]	33
House 2 S of Lake St.	APN 29-200-23	[redacted]	34
House 3 S of Lake St.	APN 29-200-24	[redacted]	35
Sportsman's Lodge	APN 29-231-10, -11	[redacted]	36
Cartago Townsite (district)	Cartago	[redacted]	37

This HPSR requests concurrence that the following 35 built-environment resources do not meet the NRHP criteria of eligibility, nor do they constitute a historic resource for the purposes of CEQA:

Segment of CA-INY-4591H (#2)

The Los Angeles Aqueduct (CA-INY-4591H) intersects US 39[redacted]. Though never formally evaluated in its entirety, the aqueduct is demonstrably significant for its association with historic events, such as the development of the City of Los Angeles; the transformation of the Owens Valley's landscape, economy, and community; and significant advances in hydraulic engineering. However, the segment that runs through the APE does not retain sufficient integrity to convey a sense of the aqueduct's historical associations for the period of significance, 1913-1957. Numerous changes have been made to expand, improve, and maintain the facility. Modifications include re-lining the aqueduct with new concrete and constructing 2-foot-high concrete parapet walls to add capacity during the 1960s and again in 1983-84, recent construction of two concrete control structures, replacing the bottom in 2001, and enclosing it with a barbed wire-topped chain-link fence. In short, the segment of the aqueduct that runs through the Project's APE has the appearance of a recently built system rather than one dating from the early 1900s. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 2.

Rustic Motel (#3)

The Rustic Motel consists of an office building, a 6-unit motel building, and a large shed. The office building was constructed by Chris Carstensen, a local merchant, in 1951. The 6-unit motel building was constructed in 1955. The enterprise was part of the tourism-associated developments in the community of Grant during the post-WWII period. Recent alterations to the motel have diminished the motel's integrity. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 3.

Olancha RV Park (#4)

The Olancha RV and Mobile Home Park consists of one main building, a residence, and approximately 60 trailer spaces. The residence, which predates the establishment of the trailer park, serves as the office for the business, as well as a dwelling for the manager/owner. The residence was built around 1953, and the trailer park was constructed beginning in 1965, with a large expansion in 1973. William Langan was one of the early proprietors, but the place was later sold to Ronald Fay, of Chino, California. The minimal-traditional style house is modest and is a very common type. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 4.

Edwin Roman House (#5)

This house was constructed in 1949 for use as a residence by Edwin Roman of Olancha, a pilot who flew sportsmen into the Sierra Nevada. The frame of the house was constructed of lumber salvaged from the internment camp at Manzanar. The property has been abandoned for several years and has suffered greatly from vandalism and deterioration. The result has been the house's considerable loss of integrity, including the removal of windows and doors. The house is a common property type, without architectural distinction, or significant historical associations. The house no longer has economic value as an improvement, and the property is classified as "vacant land" by the Inyo County Assessor. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 5.

Olancha BLM Fire Station (#6)

The former Caltrans Olancha Maintenance Station is a 1.17-acre site located on Route 395. Originally constructed in 1931, that station consisted of seven buildings. Today, only two remain, a truck shed and a gas house. The station was established by the Division of Highways to maintain US 395 between Lone Pine and Inyokern. Around 1997 Caltrans abandoned the maintenance station. Soon thereafter, the Bureau of Land Management began using it as fire station. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 6.

Ranch Motel (#7)

The Ranch Motel consists of a residence, a main lodge and office, two cabin motel units, and a laundry (converted to a motel unit). A dirt airstrip, constructed around 1948, is located to the west of the motel complex. John Grant purchased this property in 1947 and built the J.G. Motel as part of a broader plan to build a community of tourism-related businesses which he called "Grant." Although the designation appeared on maps and Caltrans had at one time identified the community with a highway sign, Grant was never incorporated as a city and it never had a post office. The motel served highway travelers and functioned as a "base camp" for sportsmen bound for the Kern Plateau in the Sequoia and Inyo National Forests. Using the services of the John Grant's "Airlift Pack Station," hunters and fishermen could stay overnight at the motel, then be flown from the nearby airstrip to the high country. The Ranch Motel represents a phase in the development of tourism in the Owens Valley fostered by the post-WWII outdoor recreation boom. Since its construction, one of the original buildings was moved to an adjacent parcel in 1985, another was moved off-site entirely in 1985, and the laundry building was remodeled and converted to a motel unit in 1986. Additionally, the complex no longer serves its original function as an air-packing station for the backcountry. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 7.

Grant Service Station (#8)

This property is a former service station constructed in 1948 to accompany the garage and store across the highway, part of John Grant's tourism and highway services development plan. By 1957 the service station was operating as "Bill Wright's Union Oil Service Station." The building is a typical, unremarkable service station of the period, with a veneer of stone applied to the lower 1/3 of the façade. Additionally, windows, portions of the roof, and the original garage doors are missing, and a stone veneer and gas pump canopy were added to the station. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 8.

Grant Garage & Store (#9)

The property is a large, single-story commercial building constructed in 1948 as part of John Grant's tourism and highway service developments. Gene Christensen later acquired the building and operated the Southern Inyo Garage and Store. The building is fairly plain, but the curvature of the false front and the pylon evoke a reference to the art moderne style. By 1957, the building was remodeled and converted to the Airflight Café, and eventually became the Stagecoach Inn. The restaurant closed in 1975, after which it was remodeled to serve as a market. The building is currently vacant, and appears to have been vacant for several years. The front windows are boarded up and part of the roof is missing. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 9.

Mobil Station (#10)

This property is a single-story commercial building constructed in 1960. A large canopy supported by metal poles covers the gasoline pumps, which are not original. The station was first a Hancock Oil Company station, and later became a BP station. The property is a common and unremarkable building type. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 10.

Castner Service Station (#11)

This single-story commercial building originally served as a gas station, but has been converted to a shop. It was constructed in 1948 and was associated with the Castner Garage, located to the north on the same parcel. The gas pumps have been removed, and the pump canopy is of recent construction. The service station is a common type. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 11.

Still Life Café (#12)

This property is a large, single-story commercial building that was originally constructed as an automotive repair garage in 1948. In 1985 is was converted to a restaurant and has also been home to a craft shop that operates on a seasonal basis. The original garage door has been removed and replaced with a 6-lite wood door in a recessed porch entry, which has been lined with decorative boards. None of the original windows remain. Those on the southern elevation have been bricked in. Those on the façade have been replaced with aluminum and vinyl sliding windows. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 12.

Raper House (#13)

This property consists of two buildings: a house constructed around 1950, and a smaller wood cottage moved to the site in 1960. The house is Minimal Traditional style. The cottage is a modest wood frame structure clad in clapboards and cornerboards. Betty Jo Raper and her husband moved into the house in 1951, soon after it was constructed. The house stands on land formerly owned by Charles Williams, and is part of the Williams Subdivision. The house is not an outstanding example of its type, and has undergone substantial alterations. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 13.

Braun House (#14)

This small, one-story residence was constructed in 1951 for William Braun. It is a common house type and has no distinguishing architectural characteristics. In 1979, the property owner constructed a larger, modified A-frame house on the property to serve as a residence. Afterward, the small house became a shop and storage building. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 14.

Inyo County Road Department Maintenance Shop (#15)

The shop is a large wood frame building on a concrete foundation, constructed in 1955. It is a standard, unremarkable corrugated sheet-metal industrial building. A large, recently constructed water tank is located north of the building. Also north of the building, on the same lot, is the Olancha Community Service District's Fire Station #2, a metal building constructed in 1985. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 15.

Cantlay House (#16)

William Cantlay built this property in 1946 as a residence for himself and his wife, Ollie. Currently, the house is abandoned and in a state of deterioration. It is a single story house made of concrete block construction made to resemble stone. The house is unusual looking and, under the county assessor, of "substandard" construction and materials. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 16.

Ness/Bellamak House (#17)

This house was constructed for Silas and Frances Ness in 1947, who moved to Olancha from Darwin when Silas took a job with the Inyo County Road Department. The house was later purchased by Robert Bellamak, and is currently owned by Barbara Bellamak, who resides there. It is a common house type with no distinguishing architectural characteristics. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 17.

Olancha School (#18)

The Olancha School property consists of the main school building and a gymnasium/multi-purpose building. The school building was constructed in 1949 by the Olancha Union Elementary School District, which had formed in 1945. The district combined the Olancha district with the neighboring Cartago Elementary School district and outlying areas such as Darwin and Haiwee. With the merger of the two districts, the Cartago School was abandoned and the original, one-room Olancha School became instantly overcrowded. Changing ideas about public education, rural schools, and the larger student population made possible by the school district merger resulted in a new school that was designed to have multiple teachers and separate classrooms for separate grades. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 18.

Calloway Motel & Store (#20)

This property contains four structures. The former Calloway motel has a long rectangular plan with a concrete foundation, adobe masonry walls, and a flat roof. Most of the windows, doors, and roof are missing. The adobe masonry is melting, and the southwest corner of the building has collapsed. The former store/motel, just north of the adobe motel, also has a long rectangular plan and a flat roof, but is of wood frame construction. It too is missing its doors and windows. The former residence is in a state of total collapse and is no more than a pile of stone and lumber rubble. The cinderblock building was added in 1970.

John Calloway purchased the property in 1924. He established a service station and boarding house (no longer extant) on the east side of US 395. In 1929, he added to his business enterprises by constructing a store and motel (the property under evaluation here) on the west side of the highway directly across from his service station. In 1938, Roy and Mary Adamson purchased the property and operated it for several years. The enterprise represented an impressive and vigorous attempt to capture several aspects of the tourist trade, while also providing locally needed services. The service station and boarding house that once stood on the east side of the highway are long gone. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 20.

Olancha Post Office (#21)

The U.S. Post Office in Olancha is housed in a former automobile repair garage of concrete block construction, which was substantially altered in 1970 in the conversion process. George and Helen DuFault built the garage after moving to Olancha from Los Angeles in 1944. Operating it themselves as a garage and service station, they eventually leased the building to the U.S. Postal Service. The building is utilitarian in style, is not an outstanding example of a type, and has been substantially altered. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 21.

Food Mart (#22)

The Food Mart, a former service station, is a single-story commercial building with a rectangular plan and a concrete foundation. It is of brick masonry construction and has a flat parapet roof. Now vacant, the windows and service bay have been boarded over. The sign atop the tall metal signpost is missing. A canopy covering the pumps is a later addition. The property was substantially remodeled in 1995, which destroyed the building's integrity of original plan. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 22.

Spainhower Anchor Ranch (#23)

This ranch no longer possesses its original structures. The remaining structures are a mobile home with a wooden shed-roof porch and a cabana, erected in 1977, and several small ancillary outbuildings of recent construction, including a metal shed, a chicken coop, and a horse shed. The ranch was originally settled by William Walker, a native of Missouri, in 1871. Walker also built an adobe building that served the community as a post office, store, and freight and stage station. That building no longer exists. George Brown, a Walker descendant, inherited the ranch in the twentieth century. In the 1960s the Browns sold the ranch and its water rights to the City of Los Angeles. The ranch is operated today by Spainhower Anchor Ranch, Inc., of Lone Pine, which leases the land from LADWP. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 23.

Lone Pine School District House (#24)

The property is a single-story residence built in 1946 to serve as a residence for teachers at the Olancha School. The house, a modest structure in the minimal traditional style, is a common house type. The house is currently owned by the Lone Pine Unified School District. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 24.

Rancho Olancha (#25)

Rancho Olancha is a former motel/tourist court, now abandoned. Three of the original tourist cabin/motel units remain. Two of these are two-unit motel buildings, one is a three-unit motel building. All have concrete foundations, wood frame construction, stucco, and flat parapet roofs. Three other units are also located on the site. They have wooden foundations, wood frame construction, board-and-batten siding, and gable roofs covered with corrugated sheet metal. A mobile home was moved onto the site in 1970s.

William Butler purchased the property from William Walker in 1914 and built a residence and hostelry around 1918. The Rancho Olancha motel was built in 1938 following Jay Saner's purchase of the property. After Saner, Mary Voight owned it. The motel ceased operations in 1955. The property is in an advanced state of deterioration and five buildings that once stood on the property have been demolished, including the main residence. The property is deteriorated to the point that the structures have no economic value in the opinion of the county assessor. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 25.

Ranch House Café (#26)

The Ranch House Café (originally the Farm House Café) is a single-story wood-frame building on a concrete foundation. To the rear of the property stand two additional buildings. One is a rectangular-plan, wood frame house with clapboard siding; the other is a log cabin storage building with a corrugated sheet metal-covered gable roof.

The Ranch House Café, originally named the Farm House Café, was built around 1934 by Whit Barber on land leased from the Lacey Ranch. In 1938 Barber sold the café to Jacob Bibbey, the owner of the service station immediately adjacent to the café. Bibbey turned the Café (and eventually the service station) over to his son-in-law, Dick Hiter. Hiter renamed the café "Dick's Farm House Café," and operated the associated service station as "Dick's Service." For many years, the café and adjoining service station served as a restaurant and stopping place for travelers on U.S. Highway 395. The service station has been removed and all that remains of it is a concrete floor slab that is now part of the café's parking area.

The café itself was a good example of a highway café of the 1930s. Subsequent alterations, however, have undermined its integrity. Additions were made to the south elevation in 1946 and 1979. The additions to the south elevation have destroyed the bilateral symmetry of the original plan. Several undated, non-historic-additions have been made to the rear of the property. The stone parapet wall at the front of the property, built by local stone mason James McKenna, has been altered by the addition of a wooden fence. The original large roof sign, an integral feature of the highway café type, has been removed, as has the neon "CAFÉ" sign that once stood in front of the property. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 26.

Jot-em Down Store (#27)

The Jot-Em-Down Store consists of a metal Quonset hut with a wooden false-front façade that was built in 1982. Random-coursed stone has been applied as a wall surface treatment on the façade from ground level to a height of approximately 2 feet.

The gas pumps and shelters are of recent construction (1996), and bear the name and logo of the Texaco chain.

The Jot-Em-Down Store---which takes its name from a fictional store in the old radio comedy series *Lum and Abner*---was moved to its present location in 1947. It originally served as a garage. It was later operated as a store by merchant Gene Menesini, who also owned a store in Darwin. It is currently owned by Parveen Shoukat. The land on which it stands, however, is leased from the Los Angeles Department of Water and Power. The Quonset hut is a common structure type, and the store is not an outstanding example. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 27.

Associate Oil Station (#28)

This property is a former service station rendered in the Art Moderne style. The building sits on a concrete foundation, is of wood-frame construction, and has a flat roof. The exterior surfaces were originally covered with stucco. Although the stucco remains, sometime during the 1960s or 1970s, the owners added a veneer of random-coursed stone to the façade and side elevations. The most striking feature is the art moderne pylon to the top of the building. The building also has curved corners and cornices. The large original garage doors have been removed and replaced with wood siding.

This property was originally an Associated Oil Company service station, built in 1936. Although the building was originally constructed in the Art Moderne style, and retains its large roof pylon, most of the building's original character has been lost. The gas pumps, pump island, and the canopy covering them are gone. The signs have been removed. Doors and windows have been replaced, removed, or boarded up. The random-coursed stone veneer further detracts from the building's integrity. The process of alteration, changing use, and neglect have materially diminished the building's integrity. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 28.

Lacey Ranch (#29)

The Lacey Ranch is located on both sides of US 395. Corrals on the eastern side were built in 1940, but have been substantially altered in recent years, including recently installed metal gates and new fencing constructed with railroad ties and steel bridge rails. On the western side are the ranch buildings. The two original ranch houses—one dating from 1916, the other from 1933—were demolished in 1998 and

1995, respectively. The only original structures remaining that are more than 45 years old are two small, one-car garages. The southernmost of these two is of wood frame construction, with a gable roof, and dates from 1916. The other garage is of masonry construction, with a gable roof. The other buildings on the ranch are either post-1956 or were moved to the site after 1956. These include a modern mobile home (c. 1990), a pole barn (1976), a shop building (1977), and a 1940 Quonset hut that was moved to the ranch in 1970 for use as a tack room. Thus the ranch no longer possesses adequate integrity of its original plan. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 29.

Mayfield House (#30)

This property consists of a 1949 residence, sheds and storage buildings, and two mobile homes. The residence is a concrete block building on a concrete foundation. The sheds and storage buildings on the property, as well as the mobile homes, were erected in the 1970s. The property is surrounded by a barbed wire fence. The house was constructed and owned by Roy Hunter, a local rancher, whose ranch is located south of Olancha. The property is currently owned by James Mayfield, of Olancha, who uses it as a residence and a place of business. The house is a very common type. The other buildings on the property were placed there in the 1970s. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 30.

Cabin Bar Café (#31)

The Cabin Bar Café, now abandoned and in an advanced state of deterioration, is a one-story wood-frame structure, with a rectangular plan and a concrete foundation. The original cladding material of the exterior walls is impossible to determine, as they have since been covered over with asbestos novelty siding. The façade has a veneer of random-coursed river rock. Most windows have been broken out or boarded over. The doors are metal. On the south elevation a neon sign reading “CAFÉ” is located in the gable end. To the north of the café is a house, which was formerly the residence of the café’s proprietor. It is a single-story wood frame building on a concrete foundation. It has a rectangular plan and a gable roof, which is clad with wood shakes. The siding of the house is weatherboard, but there is also a stone veneer on the porch wall, which matches the café. Most of the windows and the door are boarded up, and a cinder-block fence surrounds the house. A small cinder-block restroom building lies between the café and residence. A rectangular, cinder-block building at the rear of the property once housed a garage, shop, and apartment.

The Cabin Bar Café served highway travelers, sportsmen, and locals in the Olancha-Cartago area. Although the original owner is unknown, Stephen Goldfield, and later Frank Waitkus, operated the café for a number of years. The restaurant finally closed in 1979. Abandonment and vandalism have taken a toll on the building's integrity. The 1934, 1953, and 1970s remodelings, as well as the addition of two additional buildings to the site in 1953, have diminished the property's integrity as a 1920s roadside café. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 31.

Cabin Bar Ranch (#32)

Seven structures are located on the Cabin Bar Ranch property: a 1910 ranch house, a 1924 ranch house, a corral/pen/feedlot complex, a mobile home, a 1983 dwelling, a 1983 ranch gate/monument, and a stone ruin of unknown date and origin. The ranch houses and corrals are the only structures related to the historic operation of the ranch, although none date to the period of the ranch's original settlement. The 1910 ranch house has a wooden foundation and construction, board-and-batten siding, aluminum sliding windows, 1/1 double-hung sash windows, a gable roof, composition shingles, and asbestos siding (on a portion of the exterior). The house also has a large addition dating from 1976. The 1924 ranch house has a concrete foundation, and a gable roof covered in corrugated sheet metal. The original 1924 section of the building is of railroad tie construction. The remainder of the building (⅔ of its area) are additions made in 1956 and 1977. The other structures on the ranch are part of the Cabin Bar Ranch subdivision. They include a 1983 contemporary style house, a 1983 ranch gate with stone piers and rustic log uprights and crosspiece, and a stone building ruin made of river rock and concrete. The Cabin Bar Ranch was the site of the Cartago Wharf, which operated during the Owens Lake steamboat days of the late nineteenth century. The wharf is no longer extant: the timbers were salvaged, but the remains of the dry-laid rock base can still be seen. A Registered Point of Historic Interest plaque on Highway 395 at the ranch commemorates the wharf.

The ranch was originally the northern part of a larger ranch established in 1864 by Augustus Walker, an immigrant from Switzerland and one of the first settlers in the Olancha area. The ranch was then obtained by Artie Lubken, who later sold it to William Thornburgh in the early 1950s. Richard Stevens and other investors in the Cabin Bar Ranch Partnership acquired the ranch and planned to subdivide and develop a part of it for new homes. One home was erected in 1983. He also planned to drill wells to fully develop the ranch's water resources, and then sell that water to users in the Los Angeles region. Unable to make the plan succeed, he and his partners sold the ranch in 1987 to the Anheuser-Busch Brewing Co., which planned to pump ranch water into the L.A. Aqueduct for use in the company's Los Angeles brewery. The plan failed in the early 1990s, but Anheuser-Busch still owns the ranch.

All the buildings on the ranch property have been substantially altered. Some of the original ranch structures have been demolished, and mobile homes of recent construction have been added. Moreover, approximately ¼ of the ranch's area has been subdivided and there is a 1983 house on the property, as well as a 1983 stone and log ranch gate entry that was not part of the original ranch. The ruin of a stone building is located at the entrance to the subdivision. There is no indication of the ruin's date of construction, but the use of concrete in its construction points to the 20^{th} century. The ruin consists of three river rock and concrete walls. There is no floor, roof, windows, or architectural detail remaining.

The Cabin Bar Ranch might have held some significance for its association with early pioneer Augustus Walker, its status as one of the earliest ranches in the area, and its association with the Owens Lake steamboat period. However, no structures remain from that early period. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 32.

First House Immediately South of Lake Street (#33)

This property is a single-story, single-family residence with a concrete foundation and wood frame construction. Its exterior is covered with a veneer of river rock (on the façade of the 1930s section of the house) and a combination of asbestos siding and stucco on the remainder of the house. The roof is covered with corrugated sheet metal. A hay barn, stable, and corral are located at the rear of the property. The property is fenced with railroad-tie posts, 2-by-4 crosspieces, and wire mesh.

The original portion of the house was erected in 1930. In 1962 an addition was made to the north elevation. In 1963 a further addition was made to the north elevation, as well as a shed-roof addition to the south elevation. The original portion of the house comprises only about ¼ of its total area. The hay barn, stable, and corral were built on the property in 1970. The house is currently owned by Leon Bills of Cartago. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 33.

Second House South of Lake Street (#34)

The property is a single-story, single-family residence, rectangular in plan with a concrete foundation and wood frame construction. The original stucco siding has been clad in modern vinyl siding. The gable roof is covered with composition shingles. A shed-roof addition is located on the south elevation of the house. The house was constructed in 1920. An addition was added to the south elevation in 1958. It is a very modest example of a common house type, and the addition and the vinyl siding diminish its original integrity. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 34.

Third House South of Lake Street (#35)

The property is a single story residence with a concrete foundation, wood frame construction, and redwood weatherboard siding. Half the gable roof is covered by composition shingles, the other half by corrugated sheet metal. A covered porch was added to the rear of the building in 1979. The house was originally constructed in Haiwee in 1929. In 1968, it was moved to its present location at Cartago. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 35.

Sportsman's Lodge (#36)

The Sportsman's Lodge is a former motel complex that consists of six single-story buildings. The office building is of pumice block construction on a concrete foundation. A low stone wall is located in the front of the building. The northernmost building is identical in form to the office and has been converted to a residence, substantially altered as a result. It has an added concrete block chimney and an addition built onto the rear elevation, as well as a recently built garage. The main motel building is located to the rear of the property. It is rectangular in plan, of concrete block construction, and has a shed roof with composition sheeting. A single cabin is the southernmost building on the property. It is of pumice brick construction with a shed roof clad in composition sheeting. There are two small sheds located to the rear of the property.

Around 1948 Lester Border built the Sportsman's Lodge to serve tourists and recreationists drawn to the Owens Valley and Eastern Sierra. In 1952 Harry and Nan Hatfield bought the property and expanded it with four additional motel units. When the motel ceased operation in the 1970s one of the buildings was sold and converted to a private residence. The other buildings of the motel have suffered from deterioration. As a result of deterioration and the conversion of the store/post office building to a modern residence, the motel no longer possesses integrity of its original plan. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 36.

Cartago Townsite (#37)

The town of Cartago includes 33 buildings and was evaluated for the NRHP under Criterion C as a historic district with a period of significance extending from 1917 to 1932. It originated as the company town for the California Alkali Company (1917-1924), which refined soda ash (sodium carbonate), sodium bicarbonate, and other saline minerals from the brines and salt deposits of Owens Lake. The town was laid out on a grid, and residences were built to house the employees and managers. These buildings were either modestly Craftsman or represented the transitional style between Queen Anne cottages and Craftsman bungalows. The town also included the company's soda works, now in ruins. From 1924 to 1932 the mine was operated by the Inyo Chemical Company. After mining operations ceased several of the buildings were abandoned and eventually demolished. Currently, Cartago is a residential area of modest single-family homes on small lots. All of the houses appear to be of wood frame construction. On some of the vacant lots new homes were built or mobile homes were installed, sometimes across parcel lines, and businesses such as the Sportsman's Lodge, a gas station, and the peach orchard and processing plant have come and gone. The remaining original company residences and buildings have all been substantially altered, and the streets of the community remain graveled and unpaved.

Currently, Cartago contains 33 buildings. Original 1917 buildings and structures which have the potential to contribute to the historic district consist of the schoolhouse (on Lake Street), four small employee houses, nine large employee (or managerial) houses, the remains of a brick oven, and a brick vault from the plant office. The potential historic district also includes the soda works, which today consists of little more than the soda evaporating ponds on the lake bed, the concrete foundations and substructures of the old factory, other ruins (including a walk-in safe vault and a brick bakery oven), and the bed of the railroad spur that once served the plant.

The boundary of the district extends between Sierra Street on the west, Inyo Street on the north, Owens Street on the South, and the soda evaporators on the bed of Owens Lake to the east. This boundary includes all the remaining houses and community buildings from the original town, as well as the ruins of the soda processing plant, and the levees of the soda evaporators on the lakebed.

In 1885 the Inyo Development Company built the first soda ash plant on the northeast shore of the lake between Swansea and Keeler. The Natural Soda Products Company built a plant south of Keeler around 1912. California Alkali Company's plant was the third on the lake. From 1900 to the 1930s soda products from Owens Lake led the county's mineral production in terms of value, and thus Owens Lake was a major center of the United States soda industry. In 1924 the Inyo Chemical Company took over the Cartago plant, planning to continue refining bicarbonate of soda and soda ash at Cartago. It also hoped to develop potash as well, but this plan never came to fruition, as the post-war slump in the price of potash made it unprofitable. The onset of the Great Depression resulted in the plant closing in 1932, but the townsite remained a viable residential area in the southern Owens Valley. Since the plant's closing, a number of new houses were constructed, mobile homes were brought in, and original houses were extensively remodeled. Typical alterations include replacement of double-hung wood sash windows with sliding aluminum or vinyl sash windows; replacement of original siding with asbestos novelty siding, T-111 textured plywood siding or other non-historic material; covering of roofs with corrugated sheet metal; addition of cinder block chimneys; replacement of original doors with non-historic wood slab or metal doors; and room additions.

The Owens Lake soda industry is significant as one of the nation's leading sources of soda ash and bicarbonate of soda in the late 19th and early 20th century. Natural soda products were Inyo County's most profitable mineral product during the early twentieth century. The California Alkali Company plant at Cartago was part of the development of this industry as well as its association with the national industrial mobilization associated with the United States' entry into World War I.

Despite its potential for significance under Criterion A, the Cartago historic district has lost the historical integrity necessary to convey this significance. In its original state, Cartago consisted of some forty residences (worker cabins, managerial houses, and bunkhouses), a school house, a mess hall, store/ice plant/post office building, and offices for the company, as well as the processing plant. The plant consisted of evaporating ponds, lime kilns, carbonating towers, and rotary soda dryers, in addition to the storage and handling facilities needed to ship the finished soda products to market by rail. Today, however, the soda refining plant has been removed and all that remains are the concrete foundations and substructures, some miscellaneous small ruins, the lakebed evaporating ponds, and the grade for the railroad spur. Many of the other principal buildings of the facility, such as the office and mess hall, were destroyed by fire. The schoolhouse and a handful of residential buildings remain, but 4 of them (the smaller employee houses) have been altered to the extent that they now appear to be post-1956 buildings. Furthermore, development of the townsite since the plant closure in 1932 has led to the construction and placement of modern houses, mobile homes, and businesses such as the Sportsman's Lodge, a gas station, and the peach orchard and processing plant. As such, Cartago has lost the integrity of its original plan and appearance. For details of the investigation, please refer to Appendix C, Inventory Forms, Identifier: Map Reference No. 37.

Chapter 6. Findings

Caltrans requests concurrence from the SHPO that:

1. The portion of CA-INY-43 that overlaps the Phase-2 Study Area does not contain deposits that contribute to the site's NRHP eligibility under Criterion D, nor does it contain deposits that would qualify the site as a historic resource under CEQA;
2. The portion of CA-INY-1317 that overlaps the Phase-2 Study Area contains deposits that contribute to the site's NRHP eligibility under Criterion D and its qualification as a historic resource under CEQA under Criterion 4;
3. The segment of CA-INY-4590H that overlaps the APE does not possess features or deposits that meet any of the NRHP criteria of significance, and thus is not eligible for the NRHP and does not constitute a historic resource under CEQA;
4. The following six archaeological sites within the undertaking's APE are eligible for the NRHP under Criterion D, and they constitute historic resources for the purposes of CEQA under Criterion 4;

Table 6-1: Resources Eligible for the NRHP (Criterion D) and the CRHR (Criterion 4)

Name	Location	Community	Map Reference
CA-INY-1991/H[1,3]	[redacted]	[redacted]	1991/H
CA-INY-5967	[redacted]	[redacted]	5967
CA-INY-5984	[redacted]	[redacted]	5984
CA-INY-6021	[redacted]	[redacted]	6021
CA-INY-6263	[redacted]	[redacted]	6263
CA-INY-5350H	[redacted]	[redacted]	5350H

[1] Prehistoric component
[3] Portion of site not excavated due to denied access

5. The following resource is eligible for the NRHP under Criterion A, and it constitutes a historic resource for the purposes of CEQA under Criterion 1;

Table 6-2: Resource Eligible for the NRHP (Criterion A) and CRHR (Criterion 1)

Name	**Location**	**Community**	**Map Reference**
Olancha Schoolhouse	APN 33-080-07	[redacted]	19

6. The following 16 prehistoric and historical archaeological sites within the undertaking's APE are ineligible for the NRHP, and they do not constitute historic resources for the purposes of CEQA:

Table 6-3: Archaeological Resources Determined Ineligible for the NRHP and CRHR

Name	Location	Community	Map Reference
CA-INY-290	[redacted]	[redacted]	290
CA-INY-1991/H	[redacted]	[redacted]	1991/H
CA-INY-4837	[redacted]	[redacted]	4837
CA-INY-5953H	[redacted]	[redacted]	5953H
CA-INY-5956	[redacted]	[redacted]	5956
CA-INY-5957H	[redacted]	[redacted]	5957H
CA-INY-5958 [1]	[redacted]	[redacted]	5958/H
CA-INY-5958/H [2]	[redacted]	[redacted]	5958/H
CA-INY-5964	[redacted]	[redacted]	5964
CA-INY-5966	[redacted]	[redacted]	5966
CA-INY-5981	[redacted]	[redacted]	5981
CA-INY-6394H	[redacted]	[redacted]	6394H
CA-INY-6395H	[redacted]	[redacted]	6395H
CA-INY-6396H	[redacted]	[redacted]	6396H
CA-INY-6397H	[redacted]	[redacted]	6397H
CA-INY-6398H	[redacted]	[redacted]	6398H

[1] Prehistoric component
[2] Historical component

7. The following prehistoric archaeological site was not fully evaluated due to denied property access, but the portion of the site that was excavated is not eligible for the NRHP and does not contribute to any potential eligibility of the larger resource, and it does not constitute a historic resource for the purposes of CEQA (the unevaluated portions will be addressed during future evaluation efforts and future SHPO consultation):

Name	Location	Community	Map Reference
CA-INY-5990	[redacted]	[redacted]	5990

8. The following 35 built environment resources within the undertaking's APE are ineligible for the NRHP, and they do not constitute historic resources for the purposes of CEQA:

Table 6-4: Built Environment Resources Determined Ineligible for the NRHP and CRHR

Name	Location	Community	Map Reference
Segment of CA-INY-4591H	Inyo County	Olancha	2
Rustic Motel	APN 33-120-04	Olancha	3
Olancha RV Park	APN33-410-00A	Olancha	4
Ed Roman House	APN 33-110-25	Olancha	5
Olancha BLM Fire Sta.	APN 33-480-05A	Olancha	6
Ranch Motel	APN 33-480-01,02,03, 04	Olancha	7
Grant Service Station	APN 33-490-01	Olancha	8
Grant Garage & Store	APN 33-110-41	Olancha	9
Mobil Station	APN 33-100-08	Olancha	10
Castner Service Station	APN 33-460-18	Olancha	11
Still Life Café	APN 33-460-18	Olancha	12
Raper House	Fall Road, APN 33-100-19	Olancha	13
Braun House	Shop Street, APN33-100-07	Olancha	14
Inyo County Road Dept.	Shop Street, APN 33-090-02A	Olancha	15
Cantlay House	Fall Road, APN 33-090-20	Olancha	16
Ness/Bellamak House	Fall Road, APN 33-090-29	Olancha	17
Olancha School	School Street	Olancha	18
Calloway Motel & Store	APN 33-080-03	Olancha	20
Olancha Post Office	APN 33-080-15	Olancha	21
Food Mart	APN 33-080-14	Olancha	22
Spainhower Anchor Ranch	APN 33-080-34	Olancha	23
Lone Pine School District House	APN 33-080-32	Olancha	24
Rancho Olancha	APN 33-080-33	Olancha	25
Ranch House Café	APN 33-080-27F	Olancha	26
Jot-em Down Store	APN 33-080-27B	Olancha	27
Associate Oil Station	APN 33-080-27E	Olancha	28
Lacey Ranch	APN 33-080-27B	Olancha	29
Mayfield House	Lacey Lane, APN 33-080-22	Olancha	30
Cabin Bar Café	APN 33-020-02	Cartago	31
Cabin Bar Ranch	APN 33-020-11	Cartago	32
House 1 S of Lake St.	APN 29-200-26	Cartago	33
House 2 S of Lake St.	APN 29-200-23	Cartago	34
House 3 S of Lake St.	APN 29-200-24	Cartago	35
Sportsman's Lodge	APN 29-231-10, -11	Cartago	36
Cartago Townsite (district)	Cartago	Cartago	37

Submittal of this report to the SHPO will take place concurrently with distribution to the FHWA (pursuant to Stipulation VIII.C.5 of the Programmatic Agreement) and accession into Caltrans' files (pursuant to Stipulation XVI). In the event that the SHPO does not concur with the determinations presented above further consultation with the SHPO will be carried out in accordance with Stipulation VIII.C.5.b.

Pending selection of a recommended alternative, the project design will be examined to determine whether the Project has the potential to effect any unevaluated cultural resources. If so, a supplemental Historic Property Survey Report will be prepared and submitted to the SHPO.

A Finding of Effect for this undertaking, pursuant to Stipulation IX of the Programmatic Agreement, is not addressed at this time but will be pursued in future consultation with the SHPO upon selection of a recommended alternative.

Chapter 7. References

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Chapter 8. Figures

Figure 1: Project Location

Figure 2: Project Vicinity

Figure 3: Area of Potential Effects

Appendix A Archaeological Survey Report

Appendix B Lacustrine Lifestyles Along Owens Lake

Appendix C Historical Architectural Survey Report

Appendix D Historic Study Report

Appendix E Participants and Observers: Perspectives on Historic Native American Information

Appendix F Correspondence

Eastern Information Center (EIC) Correspondence

- Caltrans to EIC, Records search request, July 7, 1999
- EIC to Caltrans, results of records search, July 19, 1999

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Appendix G Additional Information

Excerpt from the Historic Bridge Inventory (Caltrans 2001)

- Page 53: see Bridge No. 48-0010

Excerpt from Archaeological Determinations of Eligibility (OHP 2000)

- Page 55: see INY-43, INY-291, and INY-371
- Page 59: see INY-3807, INY-3809, and INY-3810
- Page 61: see INY-4590H and 4607H

Site Records

- CA-INY-1317 (Berg 1992)
- CA-INY-4590H, update (Ryan 2004)

Appendix H Confidential

Olancha/Cartago Four-Lane Project

Supplemental HPSR
January 2010

I. SUMMARY OF FINDINGS

The California Department of Transportation (Caltrans), in conjunction with the Federal Highway Administration (FHWA) is proposing to upgrade the existing two-lane conventional highway to a four-lane expressway on Highway 395 between postmiles 29.2 and 41.8 improving the level of service and safety of the existing facility, provide increased capacity to meet present and future traffic demands, and ease peak traffic congestion and queuing in Olancha and Cartago. An additional alternative, known as the All-West Alternative (Alternative 4), has been added to the original study area for this project.

The nature of the proposed undertaking and the involvement of a federal agency (FHWA) require compliance with Section 106 of the National Historic Preservation Act, as codified at 36 CFR § 800. Section 106 mandates that federal agencies consider the effects of their undertakings on historic properties included in or eligible for inclusion in the National Register of Historic Places (NRHP). The purpose of this Supplemental Historic Property Survey Report (HPSR) is to document Caltrans' efforts to indentify historic properties within the area of potential effect of the All West Alternative, and seek concurrence from the State Historic Preservation Officer (SHPO) regarding the NRHP eligibility and/or non-eligibility of identified resources.

The All-West Alternative Phase 1/Phase 1.5 archaeological survey, extensive recordation, and excavation to determine cultural depth, resulted in the identification and recordation of a total of 100 archaeological sites within the APE, reflecting a high archaeological resource density. Of the 100 sites, three were previously recorded (CA-INY-323, INY-1317, and INY-4607H) and the remaining 97 sites are newly discovered in the Area of Potential Effects (APE). The site type categories include 42 historic, 37 prehistoric, 17 sites with both prehistoric and historic components, and four ethnohistoric. The most common resource types within the APE were 27 prehistoric and 19 historic era refuse deposits, suggestive of vast representation of prehistoric and historic residential use.

II. DESCRIPTION OF THE UNDERTAKING

The California Department of Transportation (Caltrans), in conjunction with the Federal Highway Administration (FHWA), proposes to upgrade the existing two-lane conventional highway to a four-lane expressway on Highway 395 between postmiles 29.2 and 41.8. Several alternatives have been proposed for this project and are addressed in the original HPSR (SHPO/FHWA # 040408A), including three build alternative with two design options (Alternatives 1, 2 and 3 with Design Option 2a and 3a), plus the no-build alternative. An All-West Alternative (Alternative 4), which proposes building west of the Los Angeles Aqueduct, was later added as an alternative and this Supplemental HPSR addresses the findings for the cultural resources survey. The defined APE for the All-West Alternative extends approximately 11 miles along the west and southwest sides of Owens Lake, west of the Los Angeles Aqueduct and west of the current Highway 395 alignment.

III. RESUME OF SURVEY

In addition to sources consulted during the initial archaeological survey (see original HPSR), standard sources of information on cultural resources were consulted for the current undertaking including a records search of previous studies and cultural resources in the area, ethnographic research on the Native Americans in southern Owens Valley, and historical research. Also, historical maps, written histories, photographs, and data from the Los Angeles DWP, the Official Records of Inyo County, and oral interviews were consulted.

For the purpose of the undertaking a Phase 1/Phase 1.5 archaeological survey of the All-West APE was conducted by Pacific Legacy, Inc. on behalf of the California Department of Transportation (Caltrans). Archaeological fieldwork commenced during April 2008 and concluded in March 2009. Archaeological efforts resulted in the identification and recordation of a total of 100 archaeological sites within the APE, reflecting a high archaeological resource density. Of the 100 sites, three were previously recorded (CA-INY-323, INY-1317, and INY-4607H) and the remaining 97 sites are newly discovered in the APE. Site types include 42 historic, 37 prehistoric, 17 sites with both prehistoric and historic components, and 4 ethnohistoric. Prehistoric and historic residential use is vastly represented with 27 prehistoric flaked stone scatters and 19 historic ere refuse deposits.

IV. PUBLIC PARTICIPATION

Ongoing efforts for coordination and consultation with other agencies and the interested public continue, along with Native American consultation (see the original HPSR for more information). [redacted]

V. RESOURCES IDENTIFIED

Resources Previously Determined Eligible

One multi-component site within the undertaking's APE was previously recommended eligible for the NRHP prior to the current study (Table 1).

Table 1. Site previously recommended eligible.

Site Number	Component(s)
CA-INY-1317 (Locus 1)	Multi-Component

CA-INY-1317
CA-INY-1317 is a prehistoric site. The portion of the site extending into the APE was originally found eligible for the NRHP under Criterion D by consensus determination between BLM and the SHPO on April 16, 1991 and again between Caltrans and SHPO on May 27, 2004 (see original HPSR, page 22 and SHPO/FHWA Reference # 040408A).

Resources Recommended Eligible

Six sites within the APE are recommended eligible for the NRHP as a result of the archaeological inventory: three historic sites, one prehistoric site, one ethnohistoric site, and one multi-component site (Table 2).

Table 2. Sites recommended eligible.

Site Number	Component(s)
PLI-29	Historic
PLI-30	Historic
PLI-31	Historic
PLI-36	Prehistoric
PLI-61	Multi-Component
PLI-74	Ethnohistoric

PLI-29
This historical site consisting of a general scatter of historical era debris over a large area and several associated features. Five historic era features include: a can and refuse dump; a three foot deep pit; a dump of slag fragments; a three-sided cellar depression; and another slag dump. Artifacts include large sized cans, abundant condensed milk cans, and simple domestic wares such as crockery, enamel ware, and kerosene lamps. The date ranges of the artifacts are consistent with construction time periods for both the L.A. Aqueduct (1909-1912) and Southern Pacific railway (1908-1913). This site is recommended as eligible for the NRHP under Criterion D.

PLI-30
This historic site consists of a debris scatter with two features; a can concentration and a deposit of slag. The slag deposit contains fire bricks and suggests a blacksmithing area. This site likely represents a construction camp site for either the L.A. Aqueduct or Southern Pacific Mojave-Owenyo Branch Railroad (CA-INY-4607H). This site is recommended as eligible for the NRHP under Criterion D.

PLI-31
This historic site consists of an extensive and diffuse trash scatter and is recommended as eligible for the NRHP under Criterion D. Artifacts include cans of various sizes, bailing wire, a gray enamelware bowl, a barrel hoop and remnant, a Dupont blasting powder lid, and a piece of amethyst glass from a bottle or jar. This site appears to be the location of

refuse associated with a work camp, either from the L.A. Aqueduct or Southern Pacific Mojave-Owenyo Branch Railroad (Ca-INY-4607H).

PLI-36

This prehistoric site consists of a diffuse flaked stone scatter with 21 flaked and ground stone tools and nine features. Artifacts include two Rose Spring series points, eight bifaces, 10 edge modified and damaged flakes, and a portable milling slab. All features represent bedrock and portable boulder milling stations. An extended Phase 1 excavation of three SPs and one STU began producing cultural material, mostly debitage, [redacted] A Haiwee Period occupation appears apparent at this probable residential site. This site is recommended as eligible for the NRHP under Criterion D.

PLI-61

This site is mainly prehistoric, but includes a sparse distribution of historic era materials as well. The features on site represent a rock clearing, several rock overhangs, a collection of boulders that appear grave-like in plan view, and a rockring. Surface artifacts include flaked stone and OVB pottery sherds. A minor historic era component is also represented at the site by a light distribution of early 20th century debris. [redacted] Late prehistoric or ethnohistoric components are probable with activities tied to resource processing, storage, and residential uses. This site is recommended as eligible for the NRHP under Criterion D.

PLI-74

The site is [redacted] recommended as eligible for the NRHP under Criterion D. [redacted] Twelve surface artifacts were recorded and these include historic era debris, glass trade beads, and one flaked stone tool.

Resources Recommended as Non-Eligible

There are a total of 69 sites within the APE recommended as not eligible for the NRHP. Of the 69 sites, 24 are prehistoric, 34 historic, nine multi-component, and two ethnohistoric (see table 3).

Table 3. Sites recommended non-eligible.

Site Number	Component(s)
CA-INY-4607H	Historic
PLI-1	Prehistoric

PLI-2	Historic
PLI-3	Prehistoric
PLI-6	Multi-Component
PLI-8	Prehistoric
PLI-9	Multi-Component
PLI-10	Multi-Component
PLI-11	Prehistoric
PLI-12	Prehistoric
PLI-13	Prehistoric
PLI-14	Historic
PLI-16	Prehistoric
PLI-17	Prehistoric
PLI-18	Historic
PLI-23	Multi-Component
PLI-24	Historic
PLI-26	Multi-Component
PLI-27	Historic
PLI-28	Prehistoric
PLI-32	Historic
PLI-33	Historic
PLI-35	Prehistoric
PLI-38	Prehistoric
PLI-39	Multi-Component
PLI-41	Prehistoric
PLI-42	Prehistoric
PLI-44	Prehistoric
PLI-45	Prehistoric
PLI-46	Historic
PLI-47	Historic
PLI-48	Prehistoric
PLI-50	Historic
PLI-52	Historic
PLI-53	Prehistoric
PLI-54	Historic
PLI-55	Historic
PLI-57	Historic
PLI-58	Prehistoric
PLI-59	Historic
PLI-60	Historic
PLI-63	Historic
PLI-64	Multi-Component
PLI-65	Ethnohistoric
PLI-66	Ethnohistoric
PLI-70	Prehistoric
PLI-72	Historic

PLI-73	Prehistoric
PLI-75	Historic
PLI-77	Historic
PLI-78	Historic
PLI-79	Historic
PLI-80	Historic
PLI-81	Historic
PLI-83	Multi-Component
PLI-84	Prehistoric
PLI-85	Prehistoric
PLI-86	Multi-Component
PLI-89	Prehistoric
PLI-90	Historic
PLI-91	Historic
PLI-92	Historic
PLI-93	Historic
PLI-94	Historic
PLI-96	Historic
PLI-97	Historic
PLI-98	Historic
PLI-99	Historic
PLI-100	Prehistoric

The 24 prehistoric sites, 34 historic sites, nine multi-component sites, and two ethnohistoric sites are recommended non-eligible for the NRHP. Prehistoric sites consist of general flaked stone scatters, historic sites consists primarily of secondary refuse and/or unassociated features, and the ethnohistoric sites consist of pottery sherds and glass beads which all sites lack sufficient information to address pertinent research questions or issues and therefore recommended as non-eligible for the NRHP (see complete descriptions in ASR – appendix 1).

Resources with Unknown Eligibility

Caltrans is not requesting a determination of eligibility for the following twenty-four sites at this time. Once the Draft Environmental Document is circulated to the public and a preferred alternative is selected, then further testing will be initiated to determine the NRHP eligibility of sites requiring evaluation within the alignment of the preferred alternative. The complexity of the sites require formal evaluation to determine NRHP eligibility. Another supplemental HPSR with the results of eligibility findings will be submitted to SHPO at a later date. Sites with unknown eligibility include: 17 prehistoric sites, 6 historic sites, and 1 ethnohistoric site (see table 4).

Table 4. Sites with unknown eligibility.

Site Number	Component(s)
PLI-4	Historic

PLI-5	Prehistoric
PLI-7	Prehistoric
PLI-19	Prehistoric
PLI-20	Prehistoric
PLI-22	Prehistoric
PLI-25	Prehistoric
PLI-34	Prehistoric
PLI-37	Prehistoric
PLI-40	Prehistoric
PLI-43	Prehistoric
PLI-49	Historic
PLI-51	Prehistoric
PLI-56	Historic
PLI-62	Ethnohistoric
PLI-67	Prehistoric
PLI-68	Prehistoric
PLI-69	Prehistoric
PLI-71	Historic
PLI-76	Historic
PLI-87	Prehistoric
PLI-88	Prehistoric
PLI-95	Historic
CA-INY-323	Prehistoric

PLI-4
This site is a multi-constituent site, but only the historic component is expected to be eligible. The historic materials date to the 1920s and post-date construction activities related to the L.A. Aqueduct and the Southern Pacific railway line. The artifacts represent an unusual household for this area, such as ceramic porcelains imported from Japan and Germany, not typical of a standard work camp.

PLI-5
This site is a prehistoric flaked stone scatter. Artifacts include three bifaces, a core, and seven edge damaged and modified flakes. A moderate but shallow cultural deposit was identified averaging 20 cm deep and consisting mostly of obsidian debitage. The high density of flaked stone and shallow cultural deposit indicates repeated or longer occupational use.

PLI-7
This site is a prehistoric obsidian flaked stone scatter consisting of two debitage concentrations and two granitic bedrock milling features. Artifacts include seven bifaces and four edge modified and damaged flakes. An extended Phase 1.5 excavation of two shovel probes (SPs) and two surface transect units (STUs) totaling 0.45 m^3 in soil volume produced substantial flaked stone quantities, one edge damaged flake, one biface

fragment[redacted] This site is representative of a probable temporary camp with resource procurement and processing as primary activities.

PLI-19

This site is a multi-component site, but only the prehistoric component is expected to be eligible. This large complex consists of 32 bedrock milling features, two of which have associated midden deposits. Artifacts include two Desert Side Notched points and one Rose-Spring point, bifaces, edge modified flakes (EMFs), handstones, milling slabs, and a few Owens Valley Brownware (OVB) pottery sherds. Temporal markers and associated assemblage indicate a Haiwee to Marana seasonal occupation for resource procurement and processing.

PLI-20

This site is a prehistoric site consisting of a light to medium density flaked stone scatter. Artifacts include an obsidian projectile point fragment, two bifaces, two EMFs, five milling slab fragments, two handstones, and three OVB pottery sherds. A chronological association with the Late Marana is indicated by OVB sherds with the assemblage reflecting repeated use associated with milling and flaked stone tool maintenance.

PLI-21

This site is a multi-component site, but only the prehistoric component is expected to be eligible. The prehistoric component consists of midden areas and numerous artifacts including flaked stone tools and debitage, groundstone (milling fragments and handstones), and OVB pottery fragments. Two loci were recorded for the prehistoric component. Locus A contains 200+ obsidian flakes, four groundstone fragments, a few chert flakes, a quartzite core remnant, OVB pottery fragments, fire-cracked rock, and burned faunal bone. Locus B constituents include obsidian debitage, two OVB pottery fragments (including a rim piece), fire-cracked rock, and a milling slab.

PLI-22

This prehistoric site is an extensive flaked and ground stone scatter with one bedrock milling feature. Artifacts include milling slabs and fragments, handstones, EMFs, OVB pottery fragments, biface fragments, two projectile points (Rose-Spring Corner Notched and Cottonwood series), and a steatite vessel wall fragment. Temporal markers signify a Marana Period occupation and an earlier Haiwee occupation with repeated site use associated with milling and flaked stone tool maintenance.

PLI-25

This site is a multi-component site, but only the prehistoric component is expected to be eligible. The site consists of a moderate density prehistoric flaked stone scatter with groundstone and milling features. A cultural deposit of obsidian flaked stone, a few tools, and two burned faunal bone fragments approximately 60cm deep were identified. This site is reflective of repeated use linked to resource procurement and processing.

PLI-34
This large prehistoric site is a flaked stone and pottery scatter. Approximately 80 sherds of OVB pottery are present, primarily body fragments but one base fragment and several rim pieces were also recorded, some in which include decorative incising. Artifacts include four projectile points of either Desert Side-notched or Cottonwood series, 11 bifaces and fragments, 13 EMFs, three milling slicks and fragments, two handstones, and a modified stone. Patches of dark stained, midden-like soil were also observed. The assemblage reflects repeated or long term use with plant processing as the primary activity. Temporal markers suggest a Marana Period occupation.

PLI-37
This prehistoric site is a diffuse flaked stone scatter with one milling feature. Artifacts include projectile points (Rose Spring and Eastgate series), biface fragments, and EMFs. Extended Phase 1- excavations of seven SPs and two STUs produced cultural material down to 50 cm below surface. Diagnostic artifacts indicate a Haiwee Period occupation.

PLI-40
This prehistoric site is a diffuse flaked stone scatter with milling features. Diagnostic artifacts include three obsidian projectile points: a large Elko series; a contracting stem form; and a side-notched point. Other artifacts include 12 bifaces, 10 edge-modified and edge-damaged flakes, a handstone, and one small quartz crystal. An area of dark stained, midden-like soil was noted near one of the milling features. Repeated site use for resource procurement and processing along with tool manufacture and maintenance activities are represented at this site. A Newberry Period component appears evident, however the full length of the occupation is unknown.

PLI-43
This prehistoric flaked stone scatter is comprised of numerous artifacts and debitage of various toolstone materials. There is also one circular rock concentration feature. A total of 32 artifacts include 15 bifaces (one is a possible drill), one uniface, and 16 edge-modified and edge-damaged flakes. An Extended Phase 1- excavation of six SPs produced obsidian debitage and depths ranging from 20 cm to 60 cm deep. Repeated and/or long term site use seems evident at this site.

PLI-49
This large historic site consists of a general distribution of debris and 10 features. The features include seven artifact scatters, a pit, a rock cairn and a rock wall segment. The site [redacted] is likely associated with activities once related to the Southern Pacific Mojave-Owenyo Branch Railroad (CA-INY-4607H) or the L.A. Aqueduct, dating from ca. 1910 into the 1930s. There appears to have been several structures and artifacts indicate a family household of middle-class means.

PLI-51
This prehistoric site consists of an extensive milling locality with flaked stone and artifact scatter. Ten bedrock milling features were recorded. Artifacts include handstones, OVB rim sherds and base fragments, projectile points, bifaces, EMFs, a perforated slate

pendant and a shaped pumice artifact. The perforated slate pendant and shaped pumice artifact represent uncommon artifacts located within the project area. The cultural assemblage suggests repeated or long term use for plant processing, storage and tool manufacturing. A probable Late Archaic – Marana period occupation is indicated by the presence of Cottonwood triangular projectile points and OVB pottery sherds.

PLI-56
This large historic site complex consists of an extensive artifact scatter and 13 discrete features. Features include structure locations, rock alignments, trash scatters and concentrations, a blacksmithing area, a rock cairn, and a 1919 survey benchmark. A wide variety and abundance of historic era artifacts were also recorded of various material types including glass, metal, ceramics, concrete, iron, fire bricks, and wood. The site likely represents a residential and work camp related to construction of the aqueduct between 1909 and 1912.

PLI-62
This possible ethnohistoric site consists of three features and assorted artifacts, primarily OVB pottery sherds. One or two vessels may be represented by the fragments, none of which are rim fragments. One of the features is an earthen depression with at least 50 historic glass trade beads. The other two features resemble rock shelters, each with rock alignments.

PLI-67
This large prehistoric site consists of eight milling features and extensive artifact scatter. Artifacts include three pieces of OVB pottery, nine bifaces, 21 EMFs, a portable millingstone fragment, one handstone, and an abrader of pumice-like materials. Darker stained soils, possible midden, are present near some of the milling station features. Site constituents indicate intensive resource processing and tool stone manufacture and maintenance.

PLI-68
This site is a multi-component site, but only the prehistoric component is expected to be eligible. The prehistoric component of this site includes a moderate density flaked stone scatter with bedrock milling features. Artifacts include a projectile point base similar to Humboldt series forms, three bifaces, two EMFs, and one handstone. Dark stained, midden like soil is present around some of the milling features, suggesting that prehistoric cultural deposits are present. Intensive and/or repeated site use tied to resource procurement and processing is represented at this site.

PLI-69
This site is a prehistoric flaked stone scatter with relatively low density. This is one of the rare sites in the project with basalt debitage. Artifacts include an obsidian Elko series projectile point and three obsidian bifaces. An excavation of three STUs and three SPs produced moderate amounts of flaked stone to 50-70cm depth, indicating that cultural deposits are present in the tested site areas. Activities at this site reflect minor resource procurement activities that occurred at a temporary camp or task site, along with flaked

stone tool maintenance and manufacture activities. The Elko point suggests Newberry Period components (ca. 3500-1350 B.P.) although the association of this tool with the larger assemblage is uncertain.

PLI-71

This site is a historic era trash scatter of approximately 100 items. Artifacts include approximately 10 brick fragments, approximately 30 ceramic fragments, approximately 40 glass fragments, miscellaneous metal, and a wood door or window frame. The refuse dates to after 1929 and was likely deposited prior to WWII. It appears to belong to a family household of some status; both women and children are indicated as being present in the household due to the types of artifacts found. The location of the site is in close proximity to the L.A. Aqueduct, Cartago, and the Southern Pacific Station.

PLI-76

This historic era site appears to have a diverse activity area, abundance of artifacts, and good integrity. It consists of an extensive and widespread artifact scatter with eleven features. The features include five terraces which may represent living areas; an area with two metal hardware concentrations, possibly representing portable blacksmithing area; two areas of charcoal and slag dumping; an adjacent pit possibly representing a trash or privy pit; and two 2-track roads or trail sections. Artifacts include bottle fragments of various colored glass, firebricks, porcelain buttons, metal buttons, miscellaneous tins and canisters, hole-in-cap cans, and 1906-S Barber Dime. There are at least 43 diagnostic artifacts and thousands of cultural constituents, dating from the early 1900s to 1910s. This site most likely represents the remains of a construction camp for the Los Angeles Aqueduct, constructed through this area between 1909 and 1912.

PLI-87

This prehistoric site consists of a sparse, widespread flaked stone scatter with one milling feature. Artifacts include six projectile points, two of which are Elko and Rose Spring series, three biface fragments, and three edge modified flakes. The surface assemblage reflects repeated site use from possibly Newberry to Haiwee times.

PLI-88

This site consists of a prehistoric flaked stone scatter. Flaked stone is mainly obsidian and includes six bifaces, one EMF, and 75 to 100 surface flakes. An excavation of two SPs and two STUs produced flaked stone to approximately 10 cm, indicating that there is a shallow prehistoric cultural deposit in certain parts of the site.

PLI-95

This historic era site is a trash scatter of approximately 250 items[redacted] It appears to have two components. The older represents camp refuse from construction of the L.A. Aqueduct between 1909 and 1912. The more recent component - dating from the 1930s to 1960s - represent refuse disposal related to machine or automobile maintenance (numerous oil cans) and alcohol consumption (beer cans). Although it is mixed with later refuse, the early component is rich and distinct, making separation of the two occupations feasible.

VI. FINDINGS

Caltrans, under the authority of FHWA, has determined that there are properties within APE of the proposed project recommended eligible for the National Register. Six archaeological sites within the undertaking's APE are recommended eligible for the NRHP (see table 2) and 69 archaeological sites within the undertaking's APE are recommended as not eligible (see table 3). There are 24 sites with unknown eligibility pending further testing once a preferred alternative is chosen (see table 4). The purpose of this Supplemental Historic Property Survey Report is to document Caltrans' efforts to indentify historic properties within the project area and seek concurrence from the State Historic Preservation Officer regarding the NRHP eligibility and non-eligibility of identified cultural resources. Under Stipulation VIII.C of the *Programmatic Agreement Among The Federal Highway Administration, The Advisory Council On Historic Preservation, The California State Historic Preservation Officer, And The California Department Of Transportation Regarding Compliance With Section 106 Of The National Historic Preservation Act* (PA), Caltrans requests the SHPO's concurrence in these eligibility determinations.

A preferred alternative has not been chosen at this time for the Olancha-Cartago 4-Lane Highway Improvement Project, once chosen, a second Supplemental Historic Property Survey Report (HPSR), a Finding of Effect (FOE) and Data Recovery Plan (DRP) will be prepared and submitted for future consultation with the SHPO.

VII. HPSR PREPARATION AND DEPARTMENT APPROVAL

Prepared by:

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Caltrans PQS – Co-Principal Investigator –
Prehistoric Archaeology

Approved by:

Tom Mills, MA, District 9 EBC/
Caltrans PQS – Principal Investigator –
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References

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Initial Site Assessment for Hazardous Waste and Addendums

State of California **Business, Transportation and Housing Agency**

Memorandum

To:	Juan Torres Assoc. Environmental Planner Southern Sierra Environmental Analysis	**Date:** September 9, 2003 **File:** 09-INY-395 KP 49.6/66.5 PM 30.8/41.3

From: DEPARTMENT OF TRANSPORTATION - District 6
Central California Hazardous Waste Branch

Subject: Request for estimates of potential assessment and cleanup costs for parcels found to have previous hazardous waste histories.

The District 9 Transportation Planning Branch initiated this project with support from the Inyo County Local Transportation Commission (LTC). The proposed candidate project will up grade the existing two-lane conventional highway to a four-lane expressway, or partial conventional four-lane highway, which will improve the level of service, ease congestion and Improve the overall safety of the highway in the area.

The Central California Hazardous Waste Branch has conducted an Initial Site Assessment (ISA) on INY-395 from PM 30.8. to PM 41.8. Field evaluations were performed on Nov 26, 2001 and again on January 21, 2002. After careful review of the proposed project and a thorough field reconnaissance, review of current VISTA Solutions Information Systems reports, Leaking Underground Storage Tank Information Systems (LUSTIS), the Hazardous Waste Branch has determined that there are minor hazardous waste concerns for this project. Staff from the Central California Hazardous Waste Branch reviewed 233 individual parcels contained within the given Area of Potential Effect Boundary (APE). Of these there are 223 parcels designated as having the potential for take. Of these 223 parcels only 5 have histories of hazardous waste problems, a further 15 have significant potential to have hazardous waste problems. Of these five, only parcel No. 113 (33-080-14) continues to have significant problems with soil and ground water contamination.

The majority of properties are vacant land with 148 parcels in private hands, 31 parcels owned by the U. S. Bureau of Land Management (BLM), 45 parcels owned by the City of Los Angeles Department of Water and Power, and 9 parcels owned by the State of California.

Several parcels have older buildings or ruins that may contain lead based paint or asbestos building materials that should be disposed in a certified land fill during demolition. Many parcels contain illegally dumped trash and debris that should be removed prior to construction.

The parcels that may have significant potential for hazardous waste problems are No's 76, 110, 113, 119, 126, 131, 141, 142, 178, 199, 204, 206, 213, 214, 215, 216. Further investigation is recommended in those cases where there is no regulatory history and avoidance for the sites having open case files.

The following list of parcels appeared on the earlier ISA are no longer considered to have significant potential for hazardous waste problems: No's 117, 118, 119, 178

76 Situs: HWY 395 , BISHOP CA 93514
APN: 29-231-04 Rec Date: 09/20/2000 Total Value: $23,500
County: INYO, CA Sale Price: $3,500 Imprv Value: $17,500
Use: COMMERCIAL BUILDING Document #: 3296 Land Value: $6,000
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 14,775
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: HARDWICK DANIEL J & NINA J & DUSTIN J Yr Built/Eff:
Mail: PO BOX 205; OLANCHA CA 93549-0205 B004

Comment: Formerly the Benbrook Gas Station. Inyo County Environmental Health Department records indicate that 3 USTs were removed and a fourth left in place. The tank excavation pits were tested and found to have no detectable contamination. The remaining tank was used as waste oil storage. The remaining tank presents significant potential for hazardous waste.

Should it be necessary to take this property, a preliminary site investigation (PSI) will be required to determine if there is contamination associated with the remaining tank.
Consultant hours will be approximately 90, costing approximately $25-30,000.
The results of that investigation will result into one of two actions:

1. No contamination is found. The costs of removal of the remaining tank will be from $10,000 to $15,000. This cost is born by the Responsible Party (RP).
2. If contamination is found, the extent of contamination will be characterized and a remedial actions options report will be produced with estimates of the costs for cleanup. Costs for this cleanup will be born by the RP. However, should Caltrans require the property prior to closure of the case, the costs of the cleanup may be subtracted from the monetary award due to the property owner. Then Caltrans would assume responsibility for compliance with the order for abatement.

110 Situs: 71 US HIGHWAY 395 , BISHOP CA 93514-7632 R002
APN: 33-080-03 Rec Date: 07/20/1999 Total Value: $49,980
County: INYO, CA Sale Price: $38,000 Imprv Value: $29,580
Use: AUTO SALES Document #: 2988 Land Value: $20,400
Card #: Zoning: 1st TD Amt: $18,000 Lot Area: 143,748
Phone: 805/583-1897 Stories: Full Baths: Half: Bldg/Liv Area:
Owners: BRADLEY REX L II Mail: 5799 NUTWOOD CIR; SIMI VALLEY

Comment: Possibly a former gasoline station. May possess significant potential for hazardous waste.
Since a regulatory history for this site is not available (possibly due to removal or abandonment prior to there being regulations requiring documenting UST removals and disposal), this sight might require removal and cleanup of at least three underground storage tanks. This site is within sixty meters of the SR-395/190 intersection and may be required for interchange construction. Should this site be required, the following should be considered:

1. A preliminary site investigation (PSI) will be required to locate UST's and characterize contamination if found. The costs of this kind of investigation are usually no more than $30K.
2. Should tanks and contamination be found the costs for removal and cleanup would probably be a minimum of $50K. If cleanup requires groundwater mitigation the costs of cleanup could exceed $100K. Time to achieve a regulatory closure of the case could be as many as 20-30 months.
3. Costs of the sight investigation would be borne by Caltrans. Costs for the removal and cleanup would be borne by the Responsible Party.

113 Situs: 40 S HWY 395 , BISHOP CA 93514
APN: 33-080-14 Rec Date: 01/01/1997 Total Value: $23,000
County: INYO, CA Sale Price: Imprv Value: $3,000
Use: SERVICE STATION/MARKET Document #: 97BPS Land Value: $20,000
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 23,522
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: RAZAQ CHAUDHRY A Yr Built/Eff:
Mail: 1501 N CHINA LAKE BLVD; RIDGECREST CA 93555-2606 C006

Comment: Doing business as One Stop Service Station: Found to have leaking UST's 4/5/2001. Preliminary site assessment plan submitted 4/16/01. Property has significant potential for hazardous waste problems. Current records for this site show the **case remains open** with no current activity to mitigate or remediate contamination.
This site is within the APE boundary. Until the Regulatory Agency issues a "no further action" letter this site should be avoided. If it is necessary to use this site for this project, the additional time and expense required complying with an order of abatement could be one to five years. The expense to complete abatement may reach $130K.

116 Situs: 330 HWY 395, BISHOP CA 93514
APN: 33-080-27C Rec Date: Total Value: $16,346
County: INYO, CA Sale Price: Imprv Value: $5,546
Use: SUPERMARKET Document #: Land Value: $2,800
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area:
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: SHOUKAT PARVEEN Yr Built/Eff:
JOT-M DOWN STORE Pool:
Mail: 437 RENEE CT; RIDGECREST CA 93555-4286 C015

Comment: Doing business as the Jot Em Down Store. This service station with three grades of gasoline. Environmental Health Department has no record of release or information concerning this site. This parcel is a series (27C, 27D, 27E) of parcels that are leased to the above by Los Angeles Department of Water and Power. This parcel has significant potential for hazardous waste. The Lahontan Regional Water Quality Control Board maintains records' showing the case remains **open**, with no current mitigation or remediation.
This site is within the APE boundary. Until the Regulatory Agency issues a "no further action" letter this site should be avoided. If it is necessary to use this site for this project, the additional time and expense required complying with an order of abatement could be one to five years. The expense to complete abatement may reach $130K.

126 Situs: 201 HWY 190, CA
APN: 33-080-36 Rec Date: 12/30/1997 Total Value: $233,984
County: INYO, CA Sale Price: Imprv Value: $211,201
Use: LIGHT INDUSTRIAL Document #: 4548 Land Value: $22,783
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 214,315
Phone: 562/863-9997 Stories: Full Baths: Half: Bldg/Liv Area:
Owners: VASQUEZ CRAIG E & CHARLENE M & RONALD L & CONSTANCE
Mail: 12001 SHOEMAKER AVE; SANTA FE SPRINGS CA 90670-4718 C017 C/O EXCEL BRDG MANUFA

Comment: This lot has a factory building and is doing business as TransferNet. There is significant potential for hazardous waste depending on the type of manufacture.

131 Situs: 601 S HWY 395, LONE PINE CA 93545
APN: 33-100-08 Rec Date: 11/09/1998 Total Value: $125,845
County: INYO, CA Sale Price: Imprv Value: $32,142
Use: WELL/GAS/OIL II Document #: 4380 Land Value: $21,194
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 37,462
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: SINGH RANJIT Yr Built/Eff:
OLANCHA MOBIL MINI MART Pool:
Mail: PO BOX 183; OLANCHA CA 93549-0183 B004

Comment: Doing business as Olancha Mobile Mini Mart. This site was formerly known as Vicki's Mobil and before that Ray's Mobil Service Station. Soil sampling during two previous tank up grades did not reveal more than a small-localized contamination patch. As such, a "no further action" status was assigned to this facility on 1/11/2001.
Since this site has a regulatory history with the case marked as "requiring no further action", this site has no significant potential for contamination. Further this site in outside the area of potential effect.

141 Situs: 2010 S HWY 395, LONE PINE CA 93545
APN: 33-110-40 Rec Date: 05/01/2000 Total Value: $85,680
County: INYO, CA Sale Price: $84,000 Imprv Value:
Use: VACANT LAND (NEC) Document #: 1443 Land Value: $85,680
Card #: Zoning: 1st TD Amt: $62,835 Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 4,744,120
Phone: 760/934-4198 Stories: Full Baths: Half: Bldg/Liv Area:
Owners: BOHL JEFFREY P Yr Built/Eff:
Mail: PO BOX 9136; MAMMOTH LAKES CA 93546-9136 B062

Comment: Vacant land being used to as dump for auto bodies and wrecked cars. Will require cleanup prior to use for construction. Costs for cleanup of this site depend on the removal and disposal of junked autos. The costs will be borne by the RP.

142 Situs: CA
APN: 33-110-41 Rec Date: 11/20/1996 Total Value: $57,284
County: INYO, CA Sale Price: Imprv Value: $37,829
Use: COMMERCIAL BUILDING Document #: 4825 Land Value: $19,455
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 299,693
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: CHRISTENSEN GENE Yr Built/Eff:
Mail: N/AVAIL;

Comment: Possibly a former gasoline station. Since a regulatory history for this site is not available (possibly due to removal or abandonment prior to there being regulations requiring documenting UST removals and disposal), this sight might require removal and cleanup of at least three underground storage tanks. This site is within sixty meters of the SR-395/190 intersection and may be required for interchange construction. Should this site be required, the following should be considered:

4. A preliminary site investigation (PSI) will be required to locate UST's and characterize contamination if found. The costs of this kind of investigation are usually no more than $30K.
5. Should tanks and contamination be found the costs for removal and cleanup would probably be a minimum of $50K. If cleanup requires groundwater mitigation the costs of cleanup could exceed $100K. Time to achieve a regulatory closure of the case could be as many as 20-30 months.
6. Costs of the sight investigation would be borne by Caltrans. Costs for the removal and cleanup would be borne by the Responsible Party.

199 Situs: 580 S HWY 395, BISHOP CA 93514
APN: 33-460-19 Rec Date: 11/15/2000 Total Value: $150,000
County: INYO, CA Sale Price: $150,000 Imprv Value: $100,000
Use: COMMERCIAL BUILDING Document #: 4004 Land Value: $50,000
Card #: Zoning: 1st TD Amt: $110,000 Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 71,874
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: NIEPAGEN JIMENEZ GUS & NANCY Yr Built/Eff:
Mail: PO BOX 108; OLANCHA CA 93549-0108 B002

Comment: Doing business as Gus' Jerky. Former gas station until 7 UST's were removed in 1992. Soil samples from beneath the tanks and sidewalls of the excavations were found to have no detectable contamination. The Inyo County Environmental Health Department issued a "No Further Action letter" closing the file.

204 Situs: 1210 S HWY 395, BISHOP CA 93514
APN: 33-470-08A Rec Date: 03/14/1997 Total Value: $184,592
County: INYO, CA Sale Price: Imprv Value: $25,225
Use: WAREHOUSE Document #: 793 Land Value: $159,367
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 4,511,074
Owners: ELTON SEAN C J Yr Built/Eff:
Mail: 13731 W ALEPPO; SUN CITY AZ 85376-5668 C/O PATRICIA A ELTON

Comment: Leased to Crystal Springs Water Co. Large rectangular lot with the APE boundary along the west edge. Within the APE boundary is a Warehouse building. If the facilities contain underground storage tanks or conduct operations that generate hazardous waste, the costs for cleanup or removal will be born by the Responsible Party (RP).

206 Situs: HWY 395, BISHOP CA 93514
APN: 33-470-09A Rec Date: 03/14/1997 Total Value: $2,431,502
County: INYO, CA Sale Price: Imprv Value:
Use: WAREHOUSE Document #: 793 Land Value: $2,431,502
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 761,429
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: ELTON SEAN C J Yr Built/Eff:
Mail: 13731 W ALEPPO; SUN CITY AZ 85376-5668 C/O PATRICIA A ELTON

Comment: Leased to Crystal Springs Water Co. Triangular lot with the APE boundary along the west edge. Within the APE boundary is a Warehouse building. If the facilities contain underground storage tanks or conduct operations that generate hazardous waste, the costs for cleanup or removal will be born by the Responsible Party (RP).

213 Situs: HWY 395, BISHOP CA 93514
APN: 33-480-05A Rec Date: 10/08/1998 Total Value:
County: INYO, CA Sale Price: Imprv Value:
Use: PUBLIC (NEC) Document #: 4053 Land Value:
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 50,965
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: UNITED STATES OF AMERICA BLM Yr Built/Eff:
Mail: 2800 COTTAGE WAY # E-2807; SACRAMENTO CA 95825-1846 C047

Comment: This parcel has several large shop buildings and other facilities located within the APE boundary. There is significant potential for hazardous waste.
Should tanks and contamination be found the costs for removal and cleanup would probably be a minimum of $50K. If cleanup requires groundwater mitigation the costs of cleanup could exceed $100K. Time to achieve a regulatory closure of the case could be as many as 20-30 months.

214 Situs:, CA
APN: 33-480-05B Rec Date: Total Value:
County: INYO, CA Sale Price: Imprv Value:
Use: WELL/GAS/OIL II Document #: Land Value:
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area:
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: SCOTSMAN MFG Yr Built/Eff:
Mail: 2550 E 68TH ST; LONG BEACH CA 90805-1731 C036

Comment: This parcel has several large shop buildings and other facilities located within the APE boundary. There is significant potential for hazardous waste.
Should tanks and contamination be found the costs for removal and cleanup would probably be a minimum of $50K. If cleanup requires groundwater mitigation the costs of cleanup could exceed $100K. Time to achieve a regulatory closure of the case could be as many as 20-30 months.

215 Situs: CA
APN: 33-490-01 Rec Date: 11/20/1996 Total Value: $16,213
County: INYO, CA Sale Price: Imprv Value:
Use: AUTO SALES Document #: 4825 Land Value: $16,213
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 71,874
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: CHRISTENSEN STACI A Yr Built/Eff:
Mail: N/AVAIL;

Comment: Possibly a former gasoline station. Since a regulatory history for this site is not available (possibly due to removal or abandonment prior to there being regulations requiring documenting UST removals and disposal), this sight might require removal and cleanup of at least three underground storage tanks. This site is within sixty meters of the SR-395/190 intersection and may be required for interchange construction. Should this site be required, the following should be considered:

7. A preliminary site investigation (PSI) will be required to locate UST's and characterize contamination if found. The costs of this kind of investigation are usually no more than $30K.
8. Should tanks and contamination be found the costs for removal and cleanup would probably be a minimum of $50K. If cleanup requires groundwater mitigation the costs of cleanup could exceed $100K. Time to achieve a regulatory closure of the case could be as many as 20-30 months.
9. Costs of the sight investigation would be borne by Caltrans. Costs for the removal and cleanup would be borne by the Responsible Party.

216 Situs: HWY 395 , BISHOP CA 93514
APN: 33-490-02 Rec Date: 10/26/1998 Total Value: $171,666
County: INYO, CA Sale Price: Imprv Value:
Use: VACANT LAND (NEC) Document #: 4213 Land Value: $171,666
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 16,820,694
Phone: 970/259-3487 Stories: Full Baths: Half: Bldg/Liv Area:
Owners: BRANDSMA MAYNARD G TRUST Yr Built/Eff:
Mail: 33 PERINS VISTA DR; DURANGO CO 81301-5857 C013

Comment: Vacant land used as a landing strip called the Adamson Landing Field. Vista Information Solutions Inc. report shows this facility was used as an ore-processing site. Report states that barrels of sodium sulfide powder were buried on site near the north end of the landing strip. This parcel has significant potential for hazardous waste problems.

The north end of the landing strip area is partially within the portion of the APE boundary that is bypassed by the alternatives. The exact location of the suspected buried chemicals is currently unknown. There is evidence of some soil disturbance within the avoided area.

If the proposed construction requires the use of this location, the costs of removal and disposal of buried hazardous materials could be as high as $50K.

For further information or if there are any questions contact Ken Doran at (559) 234-8228)

Ken Doran,

Central Region Hazardous
Waste Unit

State of California **Business, Transportation and Housing Agency**

Memorandum

To: JUAN TORRES
Assoc. Environmental Planner
Southern Sierra Environmental Analysis

Date: January 9, 2007
File: 09-INY-395
EA 213400
KP 49.6/66.5
PM 30.8/41.3

From: GERALD WHITE 1/9/07
Chief
Central Region Hazardous Waste, Water Quality
and Paleontology Branch

Subject: Request to update Hazardous Waste; Olancha/Cartago Four Lane Project.

The District 9 Transportation Planning Branch initiated this project with support from the Inyo County Local Transportation Commission (LTC). The proposed candidate project will upgrade the existing two-lane conventional highway to a four-lane expressway, or partial conventional four-lane highway, which will improve the level of service, ease congestion and improve the overall safety of the highway in the area.

The District 9 Transportation Planning Branch initiated a request to update the **cost, scoping** and **schedule** for Alternative 3a, Hazardous Waste. At a teleconference meeting on September 12, 2006, Project Manager, Brian Winzenread requested Environmentyal to update this information, because the project may become a candidate for new funding. Alternative 3a acts as the base because it is the highest in cost.

Staff from the Central California Hazardous Waste, Water Quality and Paleontology Branch reviewed 233 individual parcels contained within the given Area of Potential Effect Boundary (APE). Of these there are 223 parcels designated as having the potential for take. Of these 223 parcels only 5 have histories of hazardous waste problems, a further 15 have significant potential to have hazardous waste problems. Of the five properties with histories of hazardous waste problems, no changes have occurred in their regulatory status.As stated previously, only parcel No. 113 (33-080-14) continues to have significant problems with soil and ground water contamination.

The majority of properties are vacant land with 148 parcels in private hands, 31 parcels owned by the U. S. Bureau of Land Management (BLM), 45 parcels owned by the City of Los Angeles Department of Water and Power, and 9 parcels owned by the State of California.

Several parcels have older buildings or ruins that may contain lead based paint or asbestos building materials that should be disposed in a certified landfill during demolition. Many parcels contain illegally dumped trash and debris that should be removed prior to construction.

The parcels that may have significant potential for hazardous waste problems are No's 76, 110, 113, 119, 126, 131, 141, 142, 178, 199, 204, 206, 213, 214, 215, 216. Further investigation is recommended in those cases where there is no regulatory history and avoidance for the sites having open case files.

The following list of parcels appeared on the earlier ISA are no longer considered to have significant potential for hazardous waste problems: No's 117, 118, 119, 178

76 Situs: HWY 395 , BISHOP CA 93514
APN: 29-231-04 Rec Date: 09/20/2000 Total Value: $23,500
County: INYO, CA Sale Price: $3,500 Imprv Value: $17,500
Use: COMMERCIAL BUILDING Doc#: 3296 Land Value: $6,000
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 14,775
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: HARDWICK DANIEL J & NINA J & DUSTIN J
Mail: PO BOX 205; OLANCHA CA 93549-0205 B004

Comment: Formerly the Benbrook Gas Station. Inyo County Environmental Health Department records indicate that 3 USTs were removed and a fourth left in place. The tank excavation pits were tested and found to have no detectable contamination. The remaining tank was used as waste oil storage. The remaining tank presents significant potential for hazardous waste.

Should it be necessary to take this property, a preliminary site investigation (PSI) will be required to determine if there is contamination associated with the remaining tank.

Consultant hours will be approximately 90, costing approximately $25-30,000. The results of that investigation will result into one of two actions:

1. No contamination is found. The costs of removal of the remaining tank will be from $10,000 to $15,000. This cost is born by the Responsible Party (RP).

2. If contamination is found, the extent of contamination will be characterized and a remedial actions options report will be produced with estimates of the costs for cleanup. Costs for this cleanup will be born by the RP. However, should Caltrans require the property prior to closure of the case, the costs of the cleanup may be subtracted from the monetary award due to the property owner. Then Caltrans would assume responsibility for compliance with the order for abatement.

110 Situs: 71 US HIGHWAY 395 , BISHOP CA 93514-7632 R002
APN: 33-080-03 Rec Date: 07/20/1999 Total Value: $49,980
County: INYO, CA Sale Price: $38,000 Imprv Value: $29,580
Use: AUTO SALES Document #: 2988 Land Value: $20,400
Card #: Zoning: 1st TD Amt: $18,000 Lot Area: 143,748
Phone: 805/583-1897 Stories: Full Baths: Half: Bldg/Liv Area:
Owners: BRADLEY REX L II Mail: 5799 NUTWOOD CIR; SIMI VALLEY

Comment: Possibly a former gasoline station. May possess significant potential for hazardous waste.

Since a regulatory history for this site is not available (possibly due to removal or abandonment prior to there being regulations requiring documenting UST removals and disposal), this sight might require removal and cleanup of at least three underground storage tanks. This site is within sixty meters of the SR-395/190 intersection and may be required for interchange construction. Should this site be required, the following should be considered:

1. A preliminary site investigation (PSI) will be required to locate UST's and characterize contamination if found. The costs of this kind of investigation are usually no more than $30K.

2. Should tanks and contamination be found the costs for removal and cleanup would probably be a minimum of $50K. If cleanup requires groundwater mitigation the costs of cleanup could exceed $100K. Time to achieve a regulatory closure of the case could be as many as 20-30 months.

3. Costs of the sight investigation would be borne by Caltrans. Costs for the removal and cleanup would be borne by the Responsible Party.

113 Situs: 40 S HWY 395 , BISHOP CA 93514
APN: 33-080-14 Rec Date: 01/01/1997 Total Value: $23,000
County: INYO, CA Sale Price: Imprv Value: $3,000
Use: SERVICE STATION/MARKET Doc#: 97BPS Value: $20,000
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 23,522
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: RAZAQ CHAUDHRY A Yr Built/Eff:
Mail: 1501 N CHINA LAKE BLVD; RIDGECREST CA 93555-2606

Comment: Doing business as One Stop Service Station: Found to have leaking UST's 4/5/2001. Preliminary site assessment plan submitted 4/16/01. Property has significant potential for hazardous waste problems. Current records for this site show the **case remains open** with no current activity to mitigate or remediate contamination.
This site is within the APE boundary. Until the Regulatory Agency issues a "no further action" letter this site should be avoided. If it is necessary to use this site for this project, the additional time and expense required complying with an order of abatement could be one to five years. The expense to complete abatement may reach $130K.

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JOT-M DOWN STORE
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This site is within the APE boundary. Until the Regulatory Agency issues a "no further action" letter this site should be avoided. If it is necessary to use this site for this project, the additional time and expense required complying with an order of abatement could be one to five years. The expense to complete abatement may reach $130K.

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Phone: 562/863-9997 Stories: Full Baths: Half: Bldg/Liv Area:
Owners: VASQUEZ C E & C M & R L & C
Mail: 12001 SHOEMAKER AVE; SANTA FE SPRINGS CA 90670-4718
C017 C/O EXCEL BRDG MANUFA

Comment: This lot has a factory building and is doing business as TransferNet. There is significant potential for hazardous waste depending on the type of manufacture.

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Comment: Doing business as Olancha Mobile Mini Mart. This site was formerly known as Vicki's Mobil and before that Ray's Mobil Service Station. Soil sampling during two previous tank up grades did not reveal more than a small-localized contamination patch. As such, a "no further action" status was assigned to this facility on 1/11/2001.

Since this site has a regulatory history with the case marked as "requiring no further action", this site has no significant potential for contamination. Further this site in outside the area of potential effect.

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Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: CHRISTENSEN GENE Yr Built/Eff:
Mail: N/AVAIL;

Comment: Possibly a former gasoline station. Since a regulatory history for this site is not available (possibly due to removal or abandonment prior to there being regulations requiring documenting UST removals and disposal), this sight might require removal and cleanup of at least three underground storage tanks. This site is within sixty meters of the SR-395/190 intersection and may be required for interchange construction. Should this site be required, the following should be considered:

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Owners: ELTON SEAN C J
Mail: 13731 W ALEPPO; SUN CITY AZ 85376-5668 C/O PATRICIA A ELTON

Comment: Leased to Crystal Springs Water Co. Large rectangular lot with the APE boundary along the west edge. Within the APE boundary is a Warehouse building. If the facilities contain underground storage tanks or conduct operations that generate hazardous waste, the costs for cleanup or removal will be born by the Responsible Party (RP).

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County: INYO, CA Use: WAREHOUSE Doc#: 793 Land Value: $2,431,502
Lot Area: 761,429
Owners: ELTON SEAN C J Yr Built/Eff:
Mail: 13731 W ALEPPO; SUN CITY AZ C/O PATRICIA A ELTON

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213 Situs: HWY 395, BISHOP CA 93514
APN: 33-480-05A Rec Date: 10/08/1998 Total Value:
County: INYO, CA Sale Price: Imprv Value:
Use: PUBLIC (NEC) Document #: 4053 Land Value:
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 50,965
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: UNITED STATES OF AMERICA BLM Yr Built/Eff:
Mail: 2800 COTTAGE WAY # E-2807; SACRAMENTO CA 95825-1846
C047

Comment: This parcel has several large shop buildings and other facilities located within the APE boundary. There is significant potential for hazardous waste.
Should tanks and contamination be found the costs for removal and cleanup would probably be a minimum of $50K. If cleanup requires groundwater mitigation the costs of cleanup could exceed $100K. Time to achieve a regulatory closure of the case could be as many as 20-30 months.

214 Situs:, CA
APN: 33-480-05B Rec Date: Total Value:
County: INYO, CA Sale Price: Imprv Value:
Use: WELL/GAS/OIL II Document #: Land Value:
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area:
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: SCOTSMAN MFG Yr Built/Eff:
Mail: 2550 E 68TH ST; LONG BEACH CA 90805-1731 C036

Comment: This parcel has several large shop buildings and other facilities located within the APE boundary. There is significant potential for hazardous waste.
Should tanks and contamination be found the costs for removal and cleanup would probably be a minimum of $50K. If cleanup requires groundwater mitigation the costs of cleanup could exceed $100K. Time to achieve a regulatory closure of the case could be as many as 20-30 months.

215 Situs: CA
APN: 33-490-01 Rec Date: 11/20/1996 Total Value: $16,213
County: INYO, CA Sale Price: Imprv Value:
Use: AUTO SALES Document #: 4825 Land Value: $16,213
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 71,874
Phone: Stories: Full Baths: Half: Bldg/Liv Area:
Owners: CHRISTENSEN STACI A Yr Built/Eff:
Mail: N/AVAIL;

Comment: Possibly a former gasoline station. Since a regulatory history for this site is not available (possibly due to removal or abandonment prior to there being regulations requiring documenting UST removals and disposal), this sight might require removal and cleanup of at least three underground storage tanks.

This site is within sixty meters of the SR-395/190 intersection and may be required for interchange construction. Should this site be required, the following should be considered:

7. A preliminary site investigation (PSI) will be required to locate UST's and characterize contamination if found. The costs of this kind of investigation are usually no more than $30K.

8. Should tanks and contamination be found the costs for removal and cleanup would probably be a minimum of $50K. If cleanup requires groundwater mitigation the costs of cleanup could exceed $100K. Time to achieve a regulatory closure of the case could be as many as 20-30 months.

9. Costs of the sight investigation would be borne by Caltrans. Costs for the removal and cleanup would be borne by the Responsible Party.

216 Situs: HWY 395 , BISHOP CA 93514
APN: 33-490-02 Rec Date: 10/26/1998 Total Value: $171,666
County: INYO, CA Sale Price: Imprv Value:
Use: VACANT LAND (NEC) Document #: 4213 Land Value: $171,666
Card #: Zoning: 1st TD Amt: Lot Width: Depth:
New Pg: Map Pg: Rooms: Bedrms: Lot Area: 16,820,694
Phone: 970/259-3487 Stories: Full Baths: Half: Bldg/Liv
Owners: BRANDSMA MAYNARD G TRUST Yr Built/Eff:
Mail: 33 PERINS VISTA DR; DURANGO CO 81301-5857 C013

Comment: Vacant land used as a landing strip called the Adamson Landing Field. Vista Information Solutions Inc. report shows this facility was used as an ore-processing site. Report states that barrels of sodium sulfide powder were buried on site near the north end of the landing strip. This parcel has significant potential for hazardous waste problems.

The north end of the landing strip area is partially within the portion of the APE boundary that is bypassed by the alternatives. The exact location of the suspected buried chemicals is currently unknown. There is evidence of some soil disturbance within the avoided area. If the proposed construction requires the use of this location, the costs of removal and disposal of buried hazardous materials could be as high as $50K.

For further information or if there are any questions contact Ken Doran at (559) 234-8276

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: Gerry White
Branch Chief
Hazardous Waste

Date: September 15, 2006

File: 09-Inyo-395
PM 30.8/41.3
EA 213400

From: STEPHEN RUIZ
Environmental Planner
Southern Sierra Environmental Analysis

Subject: **Request to Update Hazardous Waste: Olancha/Cartago Four Lane Project, Alternative 3a, 09-21340**

The District 9 Transportation Planning Branch initiated a request to update the **cost, scoping** and **schedule** for Alternative 3a, Hazardous Waste. At a teleconference meeting on September 12, 2006, Project Manager, Bryan Winzenread requested Environmental to update this information, because the project may become a candidate for new funding. Alternative 3a acts as the base because it is the highest in cost.

Alternative 3A includes the following design elements:

This alternative is a variation of Alternative 3, and proposes construction of a controlled access divided four-lane highway to the west of the communities of Olancha and Cartago with the northbound and southbound lanes separated by at least a 100 ft. wide median throughout the project.

This alternative starts from the south end of the project, and up to 0.5 miles south of Cactus Flat Road. The existing lanes will be utilized for northbound traffic, and new southbound lanes will be constructed to the west.

From 0.5 miles south of Cactus Flat Road to 0.8 miles north of Whitney Street, the new northbound and southbound lanes are proposed to be constructed to the west of the communities of Olancha and Cartago, near the L. A. Aqueduct. The junction with State Route 190 will be extended to the west to connect with the new lanes.

From 0.8 miles north of Whitney Street, to 2.2 miles north of Whitney Street, the existing lanes will be utilized for northbound traffic, and new southbound lanes will be constructed to the west.

The last segment, from 2.2 miles north of Whitney Street to the north end of the project, proposes that the existing lanes be utilized for southbound traffic, and the new northbound lanes be constructed to the east.

The target date that I am looking toward for this update is **September 29, 2006**. Please let me know if you are not able to make this date.

Enclosed are copies of maps for the alternatives. Let me know if you have any questions about the maps or description. You may call me at (559) 243-8232 or email me at stephen_ruiz@dot.ca.gov.

Thank you,

Stephen Ruiz

c: Juergen Vespermann, Chief, Unit 175
Richard Putler, Associate Environmental Planner

Enclosure: Project Mapping

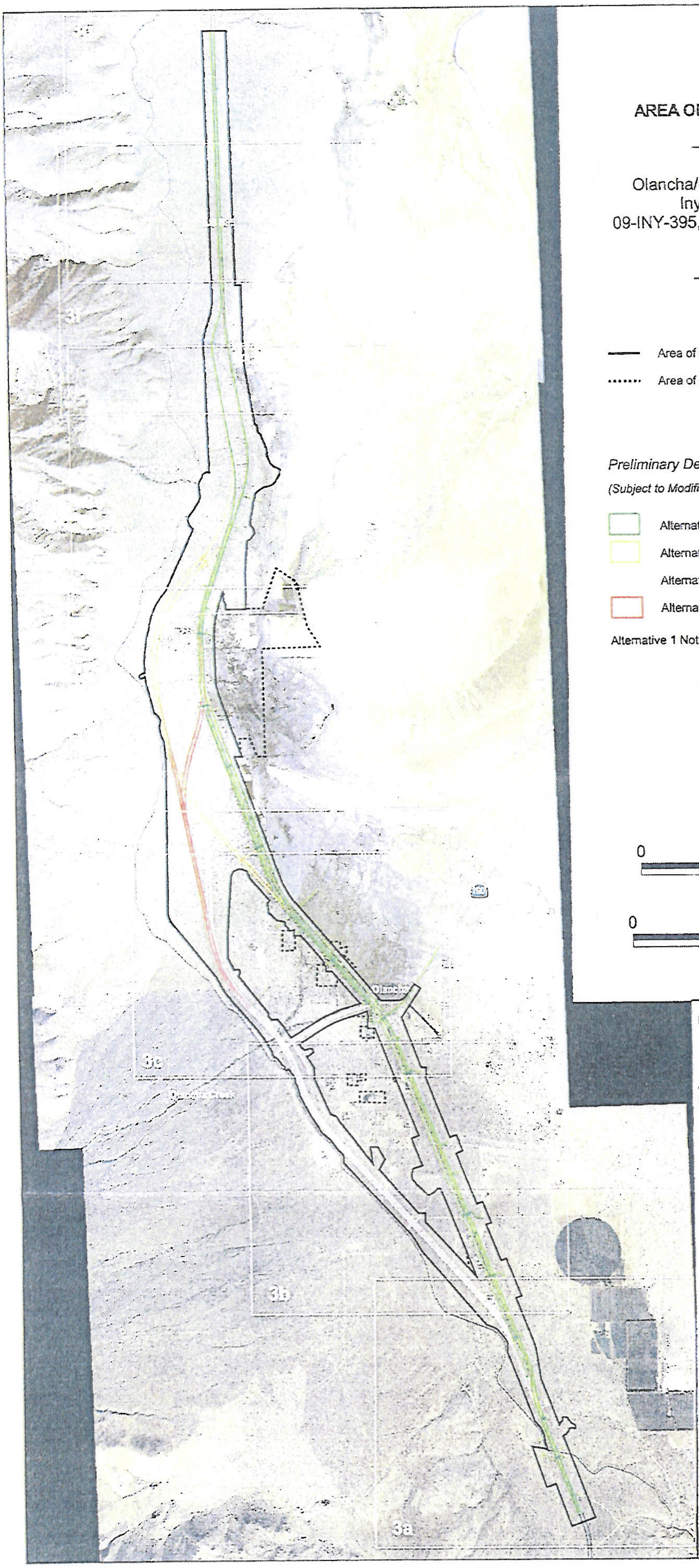

FIGURE 3
INDEX PAGE
AREA OF POTENTIAL EFFECTS

Olancha/Cartago Four-Lane Project
Inyo County, California
09-INY-395, KP 49.6/66.9 (PM 30.8/41.8)
EA 09-213400

KEY

—— Area of Potential Effects (Direct)

······· Area of Potential Effects (Indirect)

Preliminary Design Alternatives

(Subject to Modification Upon Receipt of Engineering Survey Data)

- Alternative 2
- Alternative 2a
- Alternative 3
- Alternative 3a

Alternative 1 Not Shown (Improvements to the Existing Alignment)

N
W E
S

0 1000 2000 3000
Meters

0 1 2
Miles

Prepared by:

Caltrans PQS, Principal Investigator (Prehistoric)

Date: ____________________

Recommended for Approval by:

Caltrans District 6 Heritage Resources Coordinator

Date: ____________________

Approval by:

Caltrans District 9 Project Manager

Date: 8/20/04

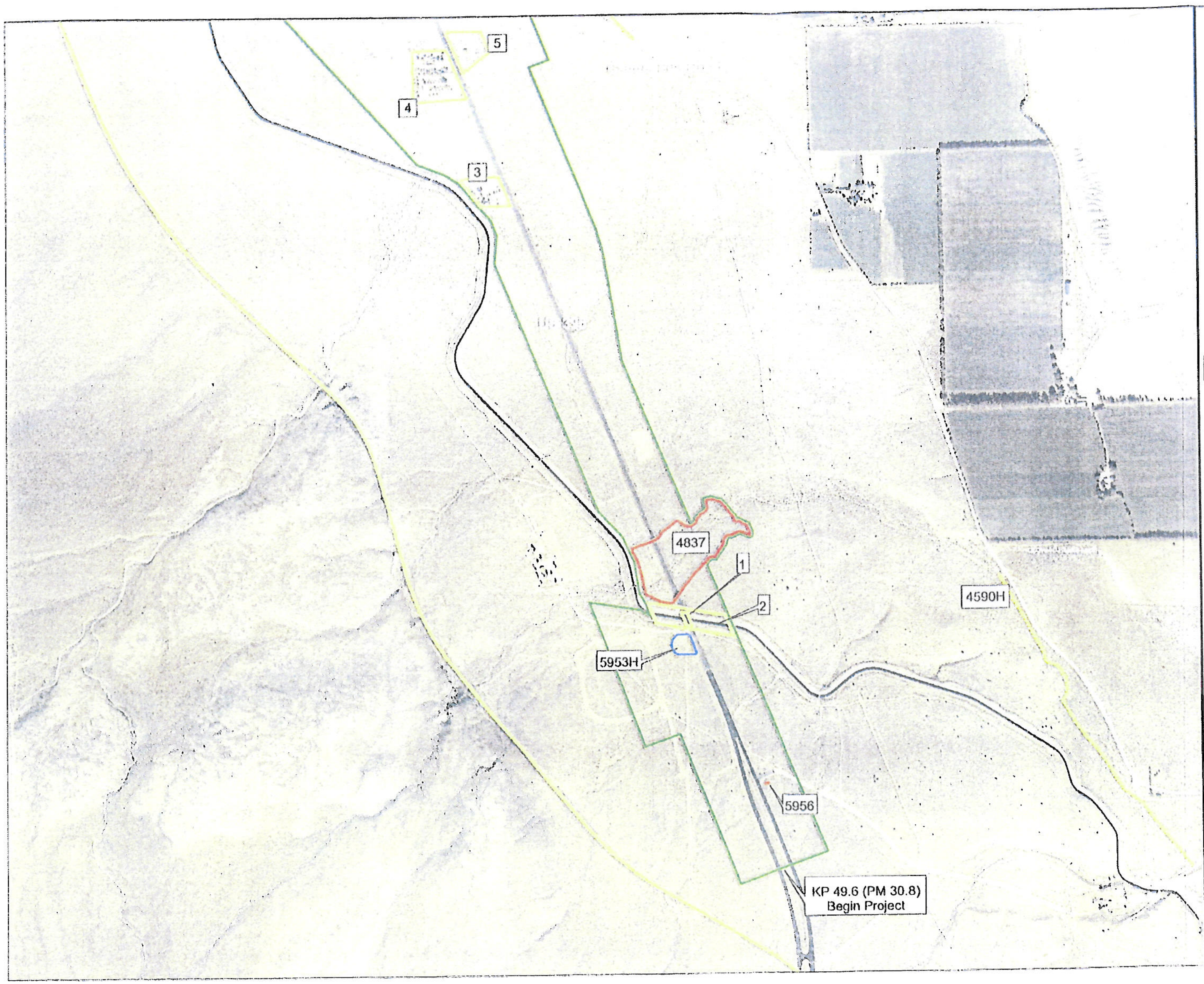

FIGURE 3a

AREA OF POTENTIAL EFFECTS

Olancha/Cartago Four-Lane Project
Inyo County, California
09-INY-395, KP 49.6/66.9 (PM 30.8/41.8)
EA 09-213400

KEY

Area of Potential Effects (Direct)

Area of Potential Effects (Indirect)

33 Map Reference Number (Architectural Resources)

5958/H Map Reference Number / Trinomial Designation

Evaluated Resources

Prehistoric Archaeological Sites (Byrd et al. 2003)

Architectural Resources (Dodd 2003)

Historical Resources (Baxter and Allen 2003)

Other Evaluated Resources

Unevaluated Resources

(Recorded In Parr et al. 2001)

N
W E
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0 300 600
Meters

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Feet

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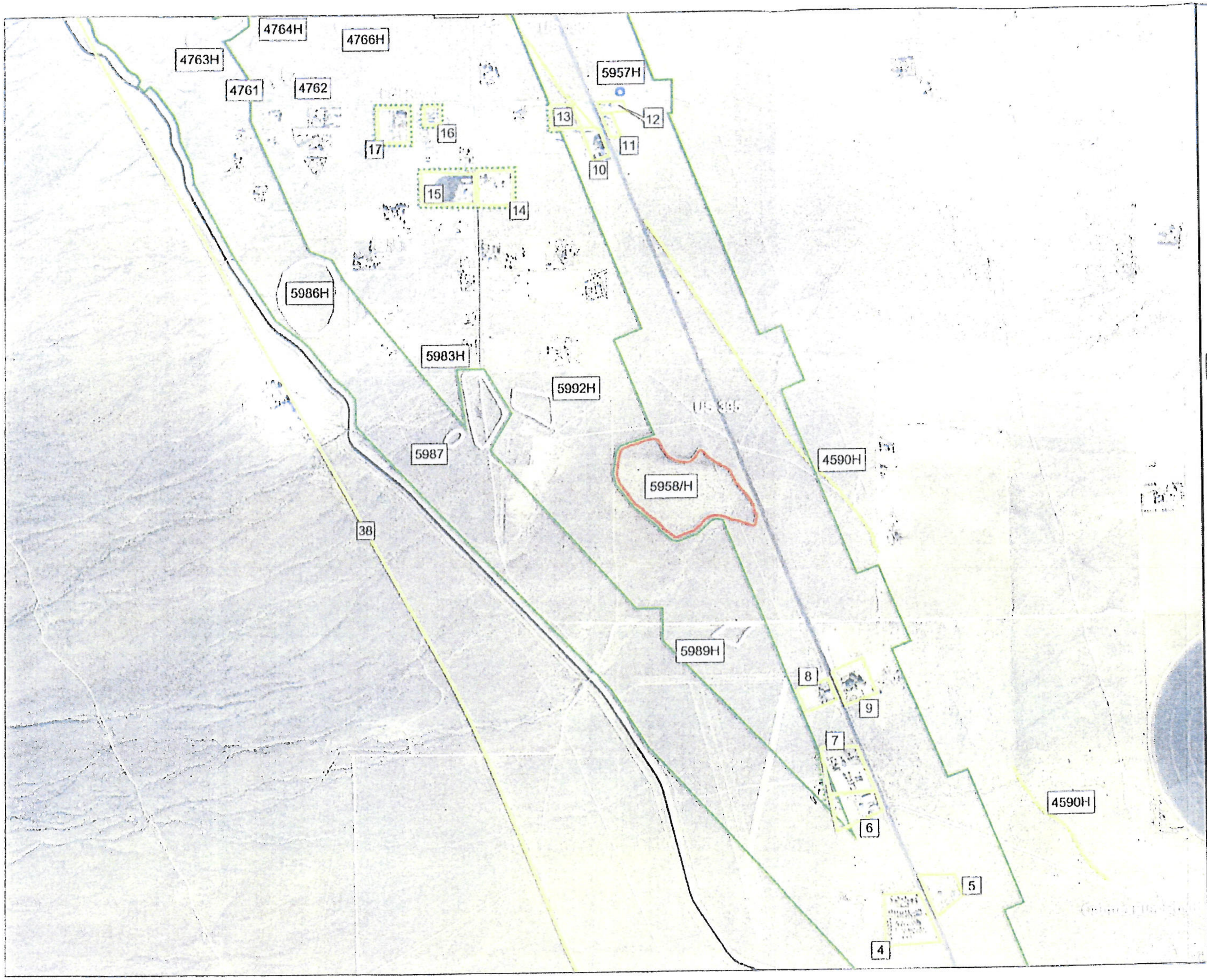


FIGURE 3b

AREA OF POTENTIAL EFFECTS

Olancha/Cartago Four-Lane Project
Inyo County, California
09-INY-395, KP 49.6/66.9 (PM 30.8/41.8)
EA 09-213400

KEY

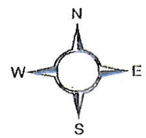
Area of Potential Effects (Direct)
Area of Potential Effects (Indirect)
33 Map Reference Number (Architectural Resources)
5958/H Map Reference Number / Trinomial Designation

Evaluated Resources

Prehistoric Archaeological Sites (Byrd et al. 2003)
Architectural Resources (Dodd 2003)
Historical Resources (Baxter and Allen 2003)
Other Evaluated Resources

Unevaluated Resources

(Recorded in Parr et al. 2001)



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Meters

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Feet

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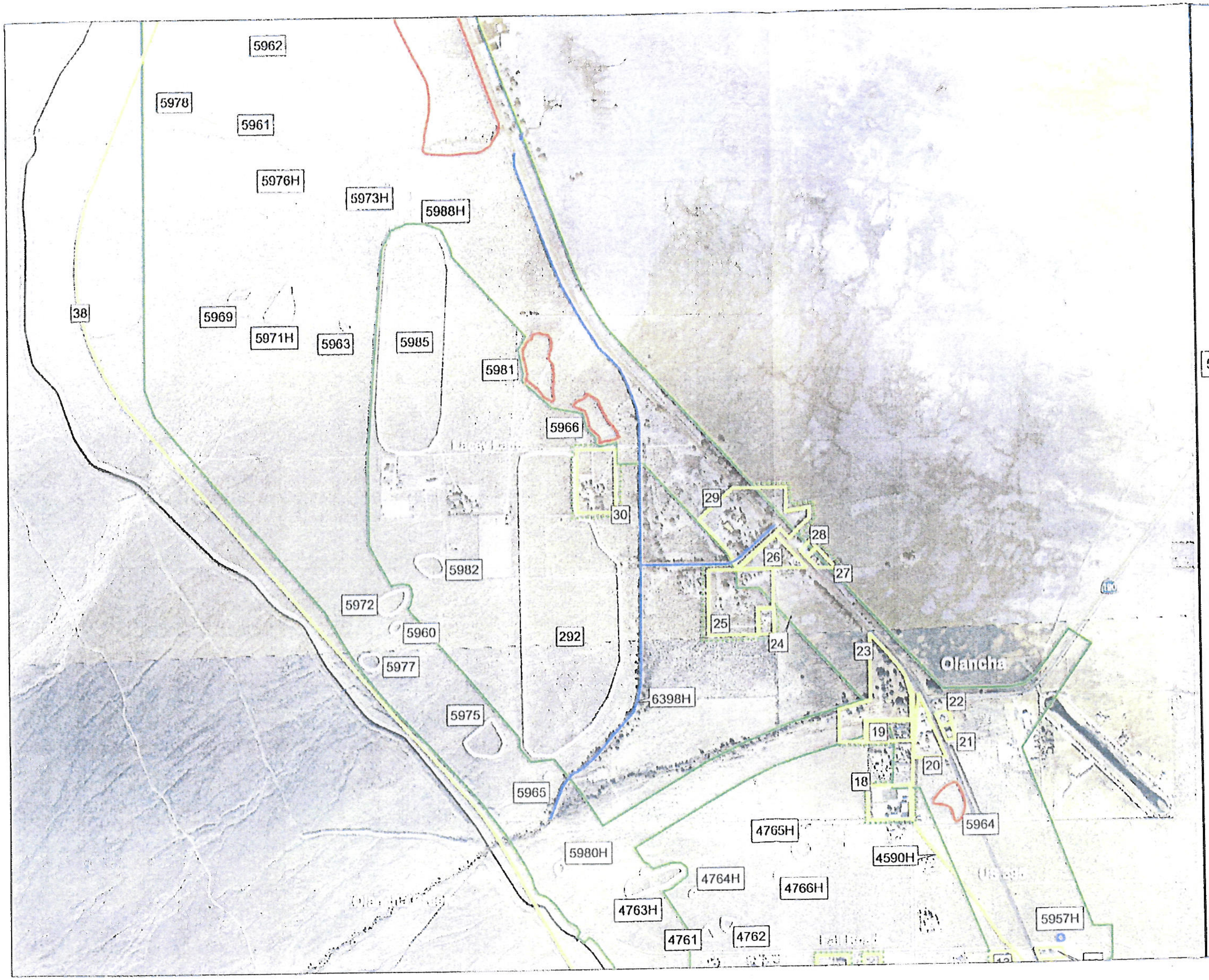

FIGURE 3c
AREA OF POTENTIAL EFFECTS

Olancha/Cartago Four-Lane Project
Inyo County, California
09-INY-395, KP 49.6/66.9 (PM 30.8/41.8)
EA 09-213400

KEY

Area of Potential Effects (Direct)
Area of Potential Effects (Indirect)
33 Map Reference Number (Architectural Resources)
5958/H Map Reference Number / Trinomial Designation

Evaluated Resources

Prehistoric Archaeological Sites (Byrd et al. 2003)
Architectural Resources (Dodd 2003)
Historical Resources (Baxter and Allen 2003)
Other Evaluated Resources

Unevaluated Resources

(Recorded in Parr et al. 2001)

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Feet

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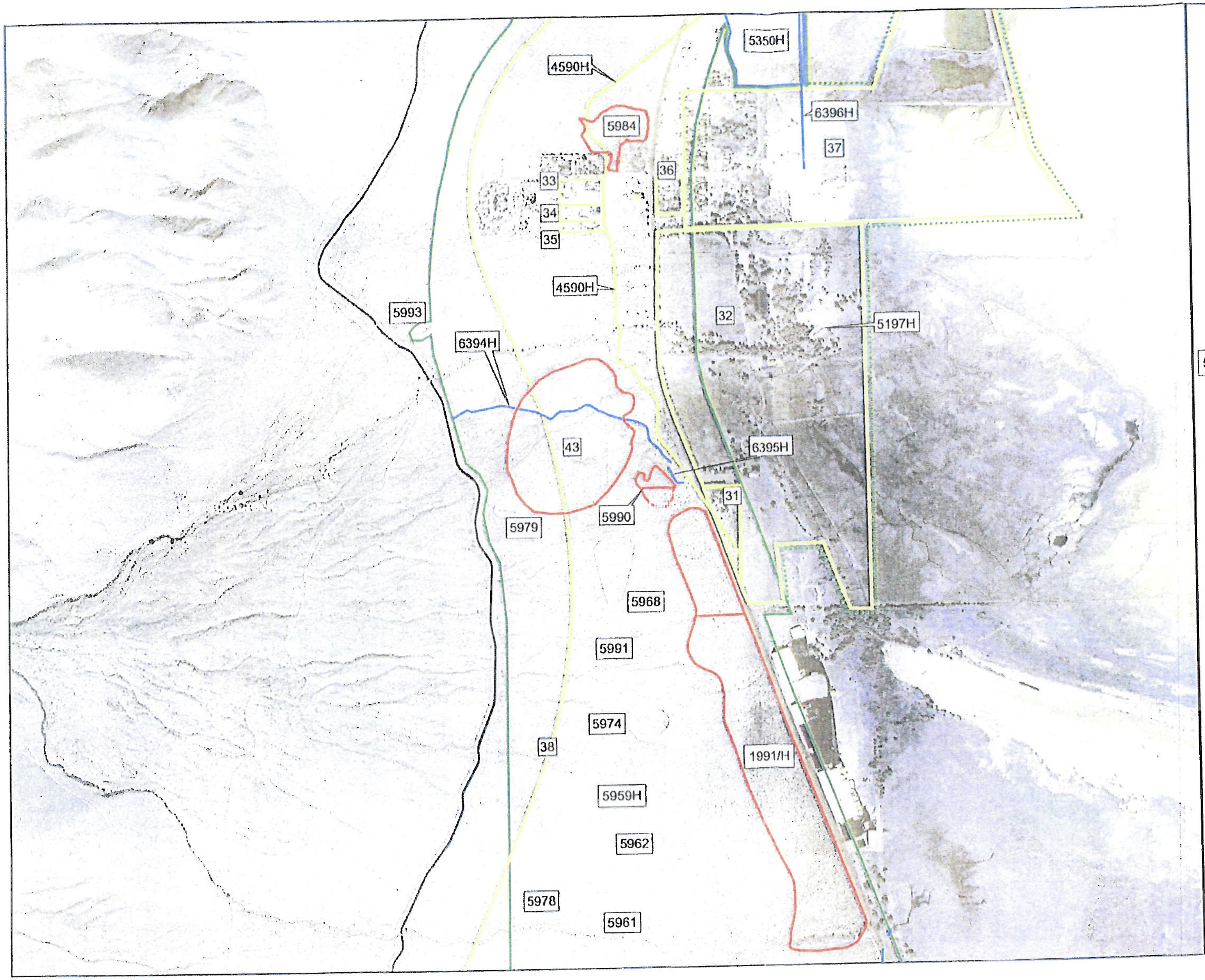

FIGURE 3d

AREA OF POTENTIAL EFFECTS

Olancha/Cartago Four-Lane Project
Inyo County, California
09-INY-395, KP 49.6/66.9 (PM 30.8/41.8)
EA 09-213400

KEY

- Area of Potential Effects (Direct)
- Area of Potential Effects (Indirect)
- 33 Map Reference Number (Architectural Resources)
- 5958/H Map Reference Number / Trinomial Designation

Evaluated Resources

- Prehistoric Archaeological Sites (Byrd et al. 2003)
- Architectural Resources (Dodd 2003)
- Historical Resources (Baxter and Allen 2003)
- Other Evaluated Resources

Unevaluated Resources

- (Recorded in Parr et al. 2001)

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Meters

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Feet

cdr

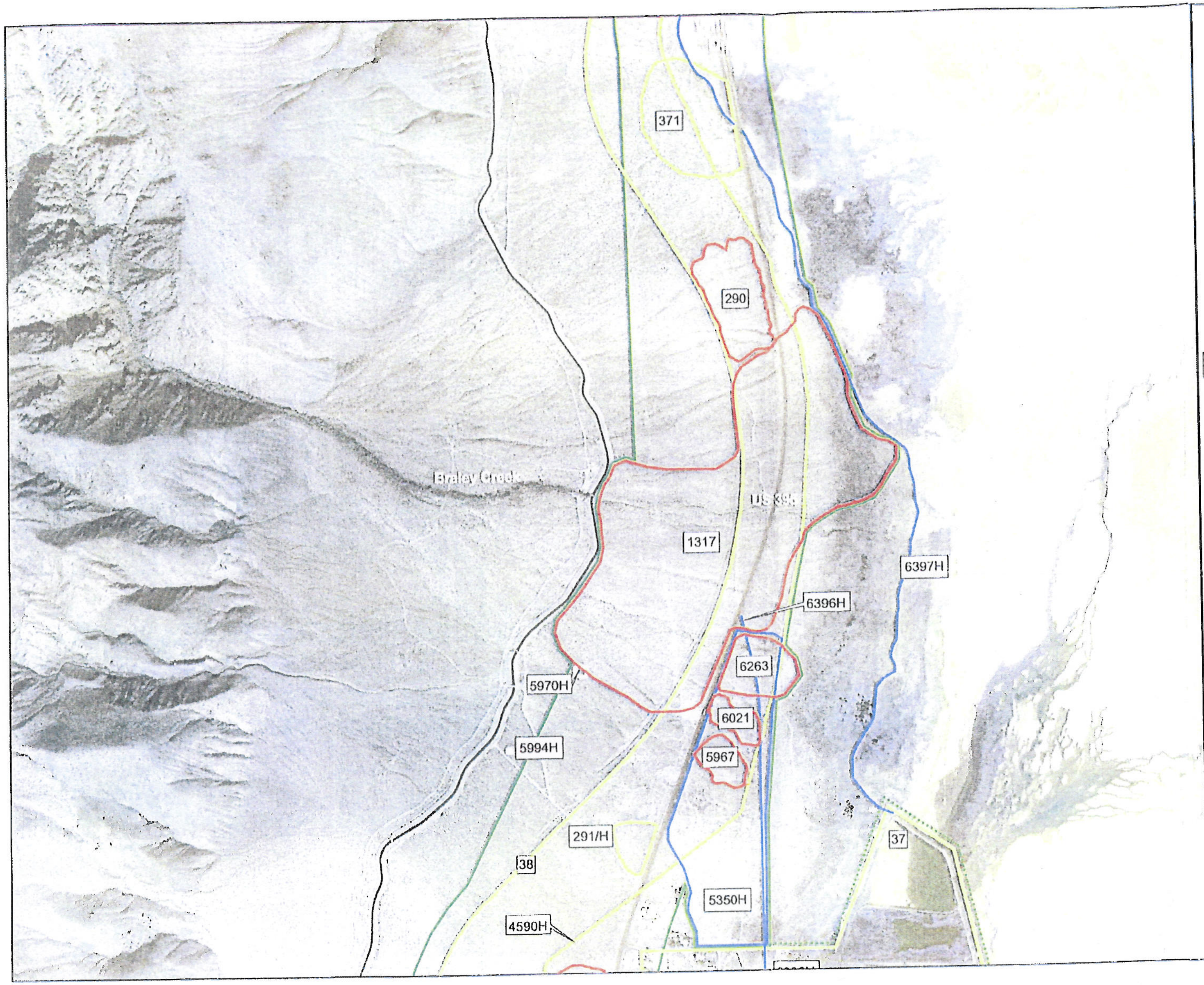

FIGURE 3e

AREA OF POTENTIAL EFFECTS

Olancha/Cartago Four-Lane Project
Inyo County, California
09-INY-395, KP 49.6/66.9 (PM 30.8/41.8)
EA 09-213400

KEY

Area of Potential Effects (Direct)

Area of Potential Effects (Indirect)

33 Map Reference Number (Architectural Resources)

5958/H Map Reference Number / Trinomial Designation

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Prehistoric Archaeological Sites (Byrd et al. 2003)

Architectural Resources (Dodd 2003)

Historical Resources (Baxter and Allen 2003)

Other Evaluated Resources

Unevaluated Resources

(Recorded in Parr et al. 2001)

N
W E
S

0 300 600
Meters

0 1000 2000
Feet

cdr

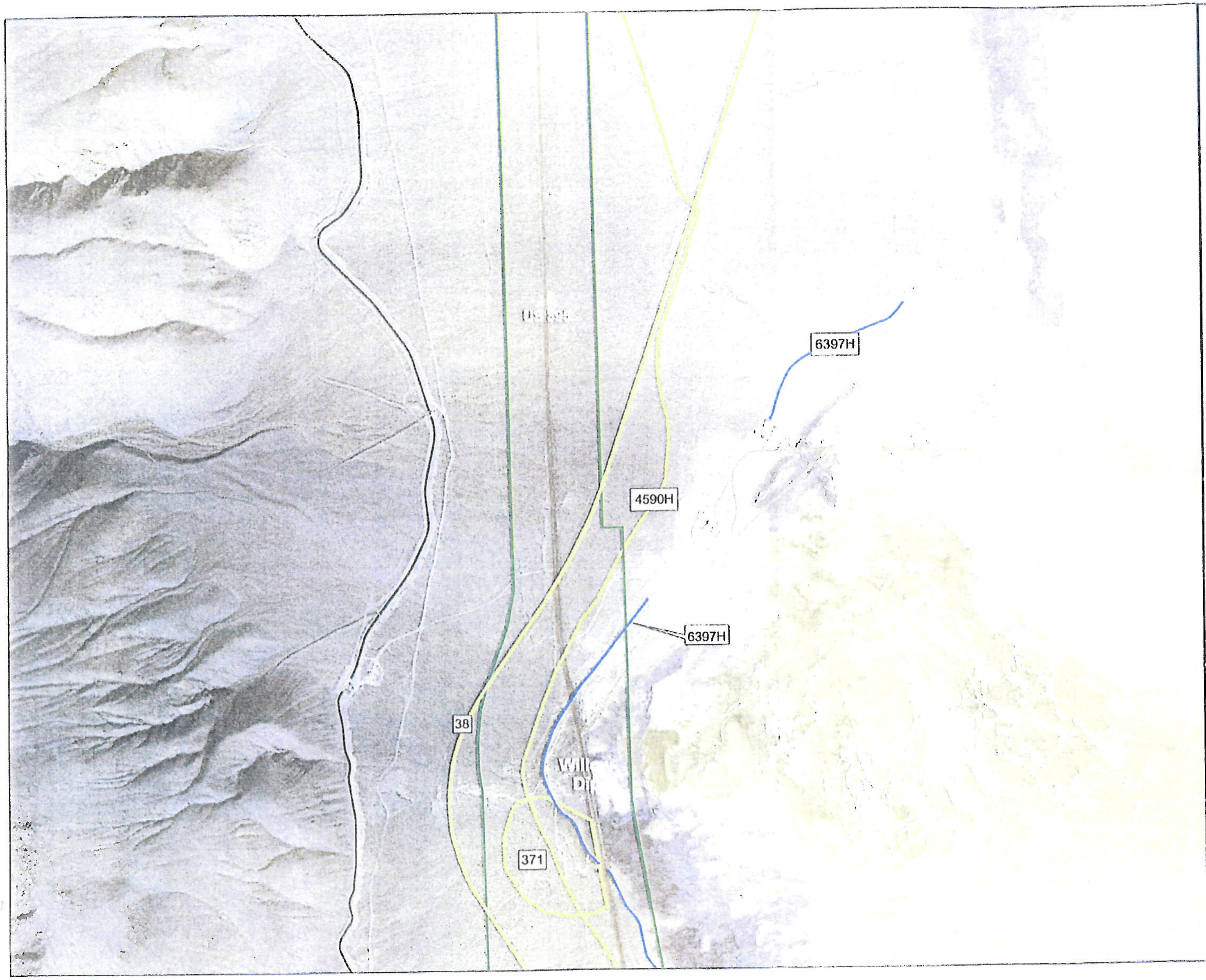

FIGURE 3f

AREA OF POTENTIAL EFFECTS

Olancha/Cartago Four-Lane Project
Inyo County, California
09-INY-395, KP 49.6/66.9 (PM 30.8/41.8)
EA 09-213400

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Prehistoric Archaeological Sites (Byrd et al. 2003)

Architectural Resources (Dodd 2003)

Historical Resources (Baxter and Allen 2003)

Other Evaluated Resources

Unevaluated Resources

(Recorded in Parr et al. 2001)

N
W E
S

0 300 600
Meters

0 1000 2000
Feet

cdr

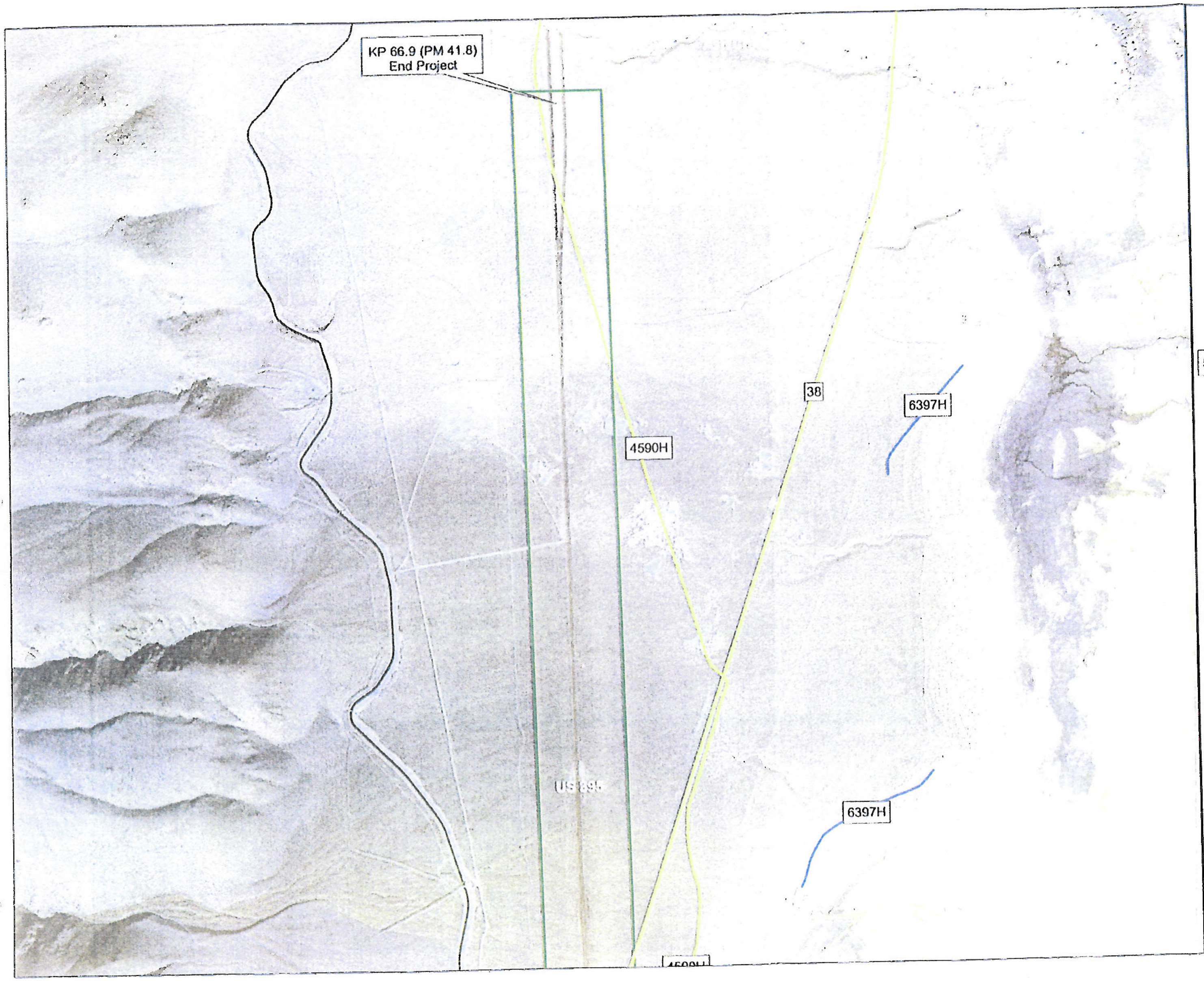

FIGURE 3g

AREA OF POTENTIAL EFFECTS

Olancha/Cartago Four-Lane Project
Inyo County, California
09-INY-395, KP 49.6/66.9 (PM 30.8/41.8)
EA 09-213400

KEY

Area of Potential Effects (Direct)

Area of Potential Effects (Indirect)

33 Map Reference Number (Architectural Resources)

5958/H Map Reference Number / Trinomial Designation

Evaluated Resources

Prehistoric Archaeological Sites (Byrd et al. 2003)

Architectural Resources (Dodd 2003)

Historical Resources (Baxter and Allen 2003)

Other Evaluated Resources

Unevaluated Resources

(Recorded in Parr et al. 2001)

N W E S

0 300 600
Meters

0 1000 2000
Feet

cdr

State of California **Business, Transportation and Housing Agency**

Memorandum

To: MATTHEW PALMER
Associate Environmental Planner
Southern Sierra Environmental Analysis Branch

Date: June 15, 2009
File: 09-INY-395
EA 213400
KP 49.6/66.5
PM 30.8/41.3

GWhite 6/16/09

From: GERALD WHITE, Chief
Central Region Hazardous Waste and Paleontology Branch

Subject: Request for update studies of U.S. 395 for Hazardous Waste.

The District 9 Transportation Planning Branch initiated this project with support from the Inyo County Local Transportation Commission (LTC). The proposed candidate project will upgrade the existing two-lane conventional highway to a four-lane expressway, or partial conventional four-lane highway, which will improve the level of service, ease congestion and improve the overall safety of the highway in the area.

The purpose of this memorandum is to provide an update to the January 9, 2007 hazardous waste study for U.S. 395 (post miles 30.8 to 41.8), due to the addition of a build alternative (Alternative 4, and 2A) described below. The initial ISA had included 223 parcels. The addition of two build alternatives (Alternative 4 and 2A) further included 43 new parcels. The current memo summarizes the investigation of the previous 223 parcels, and the new additional 43 parcels (total 266 parcels) for hazardous waste issues.

The majority of properties are vacant land with 187 parcels in private hands, 53 parcels owned by the U.S. Bureau of Land Management (BLM), 19 parcels owned by the City of Los Angeles Department of Water and Power, and seven parcels owned by the State of California.

A site visit was conducted on June 1, 2009. Several parcels have older buildings or ruins that may contain lead-based paint or asbestos building materials that should be disposed in a certified landfill during demolition. Many parcels contain illegally dumped trash and debris that should be removed prior to construction.

Alternative 4

South end of the project – Sage Flat Four-Lane (1.1 miles south of LA Aqueduct Bridge #48-10 PM 30.8) – Alternative 4 will be two lanes northbound and two lanes southbound, with a 100-foot unpaved median from PM 29.75 to north of Cartago. North of Cartago, the median will vary so as to thread existing utilities. Shoulders will be 10 feet outside and five feet inside, with a 20-foot clear recovery zone inboard and outboard. All curves are a 3,800-foot radius or larger. This alignment will eliminate a small group of trees and a spring as it is. Land taken is almost entirely agency land (Bureau of Land Management, Forest service, LA Department of Water and Power). Access will be controlled by a right-of-way fence. The new road will bear west of the current alignment at PM 29.75 and tie in approximately with the old railroad grade. The road will continue north along the west side of the LA Aqueduct. At a point just west of Cartago, the road will bridge the aqueduct and angle back into the current alignment at PM 41.8.

Access control will be purchased, and the route will be designated as an expressway. All Inyo 395 from start to end will be relinquished to Inyo County. Because this is a new alignment, the route will require adoption by the CTC. The new alignment will be known as a "Controlled Access Highway."

North end of project – Join with Ash Creek Four-Lane (0.4 mile south of Ash Creek Bridge #48-11) PM 41.8

The following parcel has potential to impact Alternative 4:

1. APN: 33-490-02A: Brandsma Maynard G Trust; Hyw 395; Vacant

   Comments: This is vacant land used as a landing strip called the Adamson Landing Field. Vista Information Solutions Inc. report of 9/9/03 shows this facility was used as an ore processing site. The report states that barrels of sodium sulfide powder were buried on site near the north end of the landing strip, although the exact location is unknown. The north end of the landing strip area is partially within the portion of the APE boundary that is bypassed by the alternatives. If the proposed construction requires the use of this location, the cost of removal and disposal of buried hazardous materials could be as high as $50K.

<u>Alternative 2A</u>

This alternative is a variation of Alternative 2, and proposes that the controlled access divided four-lane expressway be constructed to the west of the community of Cartago with the northbound and southbound lanes separated by at least a 100 ft. wide median throughout.

South End of the Project – Sage Flat Four Lane (0.45 miles south of LA Aqueduct Bridge #48-10 PM 30.8)
Same as Alternative 2.

0.8 mile north of the State Route 190 junction (PM 35.5)
Proposed that the new northbound and southbound lanes be constructed to the west of the community of Cartago.

0.8 miles north of Whitney Street (PM 38.6)
Similar to Alternative 1.

North End of Project – Join with Ash Creek Four Lane (0.4 Miles south of Ash Creek Bridge #48-11) PM 41.8

The following parcels have potential to impact Alternative 2A:

1. APN: 33-080-14: Razaq Chaudhary; 40 S Hwy 395; Service Station / Market

   Comments: Doing business as One Stop Service Station. Found to have leaking UST's 4/5/2001. Tom Lanshaw, Inyo County Assessor indicated on 5/21/2009 this property is a closed gas station. As per Inyo County Health Department (ICHD), Mark Long, Environmental Health Specialist III, this is an active LUST case. Clean-up and removal of tanks cost could exceed $70K If cleanup requires groundwater mitigation the costs of cleanup could exceed $130K. The time to regulatory closure of the case could be as many as 20-30 months.

2. APN: 33-080-27C: Shoukat Parveen; 330 Hwy 395

   Comments: Doing business as the Jot Em Down Store. This parcel is a series (27C, 27D, 27E) of parcels that are leased to the above by Los Angeles Department of Water and Power. The site address is 330 North Hwy 395, which is on the east side of Hwy 395, 0.3 mile north of the intersection of Highway 190 in Olancha. This site has a service station with three grades of gasoline. As per the ICHD, this is an active LUST case and will require remediation and/or removal of the contamination. Complete remediation could exceed $130 if groundwater contamination is present. The time to regulatory closure of the case could be as many as 20-30 months.

3. APN: 33-110-40: Bohl Fefferey P; 2010 S Hwy 395

   Comments: Vacant land being used to as dump for auto bodies and wrecked cars. This parcel will require cleanup prior to use for construction.

4. APN: 33-110-41: Christensen Gene; 1871 S Hwy 395, Olancha, CA 93549

   Comments: This site is located two miles south of the post office, which is on the west side of the Hwy 395. It is also known as the Old Union Station. Tom Lanshaw, Inyo County Assessor indicated on 5/21/2009 this parcel is now residential – a closed market store with possibly a former gasoline station. A regulatory history for this site is not available (possibly due to removal or abandonment prior to there being regulations requiring documenting UST removals and disposal). This site might require removal and cleanup of at least three underground storage tanks. There is a potential for hazardous waste and thus, a PSI will be required.

5. APN: 33-470-08B: Elton Sean C J; 1210 S Hwy 395

   Comments: Leased to Crystal Geyser, this is a large rectangular lot with the APE boundary along the west edge. As per ICHD, Crystal Geyser has minor hazardous materials under permit. No further studies are required for this site.

6. APN: 33-470-09B: Elton Sean C J

   Comments: Leased to Crystal Geyser, this is a large triangular lot with the APE boundary along the west edge. As per ICHD, Crystal Geyser has minor hazardous materials under permit. No further studies are required for this site.

The following parcels have potential to impact Alternatives 1, 2, and 3:

1. APN: 29-231-04: Hardwick Daniel J & Nina J & Dustin J; Hwy 395

   Comments: This parcel is formerly the Benbrook Gas Station. ICHD records indicate that three USTs were removed and a fourth left in place. The tank excavation pits were tested and found to have no detectable contamination. The remaining tank was used as waste oil storage and presents significant potential for hazardous waste. A PSI will be required to determine the presence and location of UST.

2. APN: 33-470-08A: Elton Sean C J; 1210 S Hwy 395

   Comments: Leased to Crystal Springs Water Co., this is a large rectangular lot that includes a Warehouse building. As per ICHD, Crystal Geyser has minor hazardous materials under permit. No further studies are required for this site.

3. APN: 33-470-09A: Elton Sean C J; 1210 S Hwy 395

   Comments: Leased to Crystal Springs Water Co., this is a triangular lot that includes a Warehouse building. As per ICHD Crystal Geyser has minor hazardous materials under permit. No further studies are required for this site.

For further information or if there are any questions contact Rajinder Brar at (559) 243-8275.

Memorandum

To: Mathew Palmer
Associate Environmental Planner
Central Sierra Analysis Branch

Date: May 12, 2010

File: EA 09-213400
Inyo-395
PM 29.2/41.8

From: Dan Holland
Associate Environmental Planner
District 9 Environmental Engineering

Subject: Updated Project Description for Hazardous Waste Study

Objective

This memo is to serve as a notice that the findings in the attached study will not change with this modified project description below.

Furthermore, the listings of hazardous waste sites have changed over time as they are cleaned up, standards have changed, project alignments have changed, etc. The March 17th, 2010 Initial Site Assessment represents the current hazardous waste conditions as of that date.

Project Description

The California Department of Transportation (Caltrans), as CEQA lead agency, and the Federal Highway Administration, as NEPA lead agency, propose to convert approximately 12.6 miles of the existing U.S. Highway 395 from a two-lane conventional highway into a four-lane expressway or partial conventional four-lane highway from post mile 29.2 to post mile 41.8 in Inyo County. The project proposes five alternatives with varying amounts of construction on new alignments. The new facility would have four 12-foot lanes with a median of variable width. There would be paved shoulders throughout the project, five feet wide on the inside and ten feet wide on the outside. This project also proposes constructing new concrete bridges to cross the Los Angeles Aqueduct, and installing concrete box culverts and smaller pipe culverts throughout the project limits to promote drainage. Under some of the proposed alternatives, this project may extend State Route 190 to intersect with the proposed improvements. A borrow site at the end of Fall Road and south of Olancha Creek would be used to provide soil and road materials for the project.

Alternative 1

This alternative proposes constructing segments of conventional all-paved, conventional divided and controlled access four-lane divided highway. The new facility would follow

the existing highway alignment, with the existing lanes being incorporated into the new facility. While this alternative would not bring the entire project up to expressway standards, it would still provide a facility meeting the concept facility of four-lanes in Inyo County.

The proposed segments of this alternative are as follows:

- Begin Work – 0.45 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.8) Four-lane divided expressway. The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.
- 0.5 miles south of Cactus Flat Road (PM 32.1) Four-lane all-paved highway. The existing highway will be widened asymmetrically to the east.
- 0.1 miles south of SR 190 junction (PM 34.6) Four-lane all-paved highway. The existing highway will be widened asymmetrically to the west.
- 0.9 miles north of SR 190 junction (PM 35.6) Four-lane divided expressway. The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.
- 0.3 miles south of Lake Street (PM 37.3) Four-lane all-paved highway. The existing highway will be widened asymmetrically to the west.
- 0.6 miles north of Whitney Street (PM 38.4) Four-lane divided expressway. The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.
- 2.3 miles north of Whitney Street (PM 40.1) Four-lane divided expressway. The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.
- End Work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 41.8)

The four-lane all-paved highway would consist of four 12-foot lanes and 10-foot outside shoulders, with the northbound and southbound lanes separated by a 14-foot paved median. The new facility would be widened asymmetrically to conform to existing environmental and right of way constraints.

In particular, the segment north of SR 190 would be widened to the west to avoid wetlands that exist in the irrigated pasture lands to the east. Access would not be controlled and the paved median would be delineated for turning movements, which would allow the existing access through the corridor to be preserved. Due to the access considerations, the all-pave segments would be designated as conventional highway and would be designed for a 65 mph design speed.

The four-lane divided highway would consist of four 12-foot lanes, with 5-foot inside shoulders and 10-foot outside shoulders. The new lanes would be constructed parallel to the existing lanes and would be separated by at least a 100-foot unpaved median. In the segments on the north and south sides of the project, access from the side would be controlled to existing intersections and other significant access points and access across the facility would be restricted to at-grade median crossovers.

The segment of divided highway between PM 35.6 and PM 37.3 would not have controlled access and would be designated as conventional highway. The four-lane divided highway would meet expressway standards and would be designed for a 75 mph design speed.

This alternative uses the existing highway and would be constructed largely at grade, so there would be limited opportunity for adjustments in horizontal and vertical alignment. The existing substandard curve at PM 37.2 would be replaced with a larger curve, but otherwise the new alignment will follow the existing horizontal alignment. Similarly, the vertical profile would only be changed appreciably near PM 40.0 on the north side of Willow Dip to improve sight distance. In addition, the roadway cross-slopes in the new facility would vary due to conforming to the existing roadway.

There are two structures associated with this alternative. A reinforced concrete bridge would be built near PM 31.3 and would carry the new southbound lanes across the Los Angeles Aqueduct. A new reinforced concrete box culvert may also be required near PM 37.30 and would carry the N. Fork of Cartago Creek under the new all-pave facility. There would be no undercrossings proposed for this alternative.

Alternative 2

This alternative proposes constructing a controlled access four-lane divided expressway throughout the project. In Olancha, the new expressway facility would follow the existing highway alignment, but would be constructed adjacent to the existing highway. Through Cartago and north to the end of the project, the new expressway would still follow the existing alignment, but would incorporate the existing lanes into the new facility. This alternative would provide the ultimate concept facility for U.S. 395.

The proposed segments of this alternative are as follows:

- Begin Work – 0.45 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.8) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 1.1 miles south of Cactus Flat Road (PM 31.5) New northbound and southbound lanes will be constructed to the east of the existing highway.

- 0.3 miles south of SR 190 junction (PM 34.4) New northbound and southbound lanes will be constructed to the west of the existing highway.

- 0.3 miles south of Lake Street (PM 37.3) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 2.3 miles north of Whitney Street (PM 40.1) The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.

- End Work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 41.8)

The four-lane divided expressway would consist of four 12-foot lanes, with 5-foot inside shoulders and 10-foot outside shoulders. The northbound and southbound lanes would be separated by at least a 100-foot unpaved median. Access from the side would be controlled to existing intersections and other significant access points and access across the facility would be restricted to at-grade median cross-overs. With controlled access and divided lanes, the traveling speeds are anticipated to be higher, so the new expressway facility would be designed for a 75 mph design speed.

This alternative would be constructed parallel to the existing highway. However, construction of a new facility would allow the improvement of the existing horizontal alignment with larger radius curves. The facility would again be constructed largely at-grade, with the only major adjustment in vertical profile occurring at the passing lanes north of Willow Dip. The new construction would also provide consistent roadway cross-slopes.

The existing highway would be extended along the new alignment to SR 190 and would be converted to frontage road between PM 31.9 and PM 37.1. With connections at major intersections and at either end, the frontage road would serve as a collector road to the new expressway. It would also preserve the existing uses and access on the southwest and northeast sides of Olancha. Once the project is completed, the frontage road would be relinquished to Inyo County.

Access to the new expressway would be provided at existing intersections with State Route 190 and several Inyo County roads: Cactus Flats Road, Walker Creek Road, Fall

Road, School Street, Lake Street, and Whitney Street. The intersections would be reconstructed and realigned to conform to the new facility. Access to parcels abutting the existing highway would be provided from the proposed frontage road, existing dirt roads, and other significant access points.

There are several structures associated with this alternative. A reinforced concrete bridge would be built near PM 31.30 and would carry the new southbound lanes over the Los Angeles Aqueduct. Two reinforced concrete box culverts may also be required near PM 37.30 to carry the N. Fork of Cartago Creek under the new expressway. Two reinforced concrete box culverts are also proposed near PM 38.30 and would serve as multi-purpose undercrossings under the new expressway. Minor grading would be required to construct a new dirt road to connect to existing dirt roads nearby.

Alternative 2A

This alternative is similar to Alternative 2 and proposes constructing a controlled access four-lane divided expressway throughout the project. In Olancha, the new expressway facility would still follow the existing highway alignment, but would be constructed adjacent to the existing highway.

Instead of passing through Cartago, though, this alternative would pass to the west of Cartago and then return to the existing alignment. This alternative would also provide the ultimate concept facility for U.S. 395.

The proposed segments of this alternative are as follows:

- Begin Work – 0.45 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.8) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 1.1 miles south of Cactus Flat Road (PM 31.5) New northbound and southbound lanes will be constructed to the east of the existing highway.

- 0.3 miles south of SR 190 junction (PM 34.4) New northbound and southbound lanes will be constructed to the west of the existing highway.

- 0.9 miles north of SR 190 junction (PM 35.6) New northbound and southbound lanes will be constructed to the west of the existing highway and will pass west of Cartago.

- 0.8 miles north of Whitney Street (PM 38.6) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 2.3 miles north of Whitney Street (PM 40.1) The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.

- End Work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 40.8)

As with Alternative 2, this alternative would be constructed parallel to the existing highway through Olancha. Beginning at PM 35.6, the alignment would diverge from the existing highway as it passes to the west of Cartago and then return to the existing highway near PM 38.6. Due to this diversion, this alternative would require a significant change in vertical profile as it climbs the alluvial fan to the west of Cartago. The diversion also makes this alternative longer by about 0.3 miles.

The existing highway would still be converted to a frontage road, but the frontage road would extend further to the north of Cartago to join the new alignment, which would preserve the existing uses and access through Cartago as well. The length of frontage road that would be relinquished to Inyo County would be increased to 6.2 miles. The number of access points to the new expressway would be reduced by one as the intersections at Lake Street and Whitney Street would now connect to the frontage road. An additional access point would be provided south of the Crystal Geyser Bottling Plant to improve their access to the new expressway.

The number of structures required with this alternative would be the same as Alternative 2. However, the western alignment would change the location of the proposed reinforced concrete box culverts. The box culverts required for the N. Fork of Cartago Creek would be relocated to the west as would the box culverts required for the proposed multi-purpose undercrossings. The relocated undercrossings would require additional grading to restore access to the existing dirt roads in the area. There would also be an alternative location available for the multi-purpose undercrossings on the southwest side of Cartago.

Alternative 3

This alternative is also similar to Alternative 2 and would construct a controlled access four-lane divided expressway throughout the project. Rather than following the existing highway, the proposed alignment would pass to the west of Olancha and return to the existing alignment south of Cartago.

Through Cartago and north to the end of the project, the new expressway would follow the existing alignment and would incorporate the existing lanes into the new facility. This alternative would also provide the ultimate concept facility for U.S. 395.

The proposed segments of this alternative are as follows:

- Begin Work – 0.45 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.8) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 0.5 miles south of Cactus Flat Road (PM 32.1) New northbound and southbound lanes will be constructed to the west of the existing highway and will pass west of Olancha.

- 0.3 miles south of Lake Street (PM 37.3) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.

- 2.3 miles north of Whitney Street (PM 40.1) The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.

- End Work – 0.1 miles south of Ash Creek Bridge, #48-11 (PM 41.8)

Beginning at PM 32.1, the alignment for this alternative diverges from the existing highway as it passes to the west of Olancha and then returns to the existing highway near PM 37.3. Due to the diversion, this alternative would require a significant change in vertical profile as it climbs the alluvial fan west of Olancha. It would also require that SR 190 be extended approximately 0.7 miles to meet the proposed alignment. The diversion makes this alternative about 0.2 miles longer.

The existing highway would be converted to frontage road, but the frontage road would begin near PM 37.3 and extend south of Olancha to join the proposed alignment near PM 32.4. The length of frontage road that would be relinquished to Inyo County would be reduced to 4.8 miles. The number of access points to the new expressway would be reduced by five as several of the access points in the Olancha area would now connect to the frontage road. Access would still be provided at the existing intersections with Lake Street and Whitney Street in Cartago.

The number of structures and location of structures required for this alternative would change due to the western alignment. Rather than being distributed through several irrigation channels, the crossing of Olancha Creek would occur at one location in an incised channel and could require reinforced concrete box culverts. Box culverts would still be required for the crossing of the N. Fork of Cartago Creek and the proposed multi-purpose undercrossings north of Cartago. An alternative or additional location for multi-purpose undercrossings would also be available near Olancha Creek. Additional drainage structures may be required to handle overflows of the Los Angeles Aqueduct from large storm events.

Alternative 4 (*All West Alternative*)

This alternative would construct a controlled access four-lane divided expressway for the entire length of the project. The new expressway would be constructed west of the Los Angeles Aqueduct and would pass to the west of both Olancha and Cartago. It would return to the existing highway north of Cartago and continue to follow the existing alignment to the end of the project, incorporating the existing lanes into the new facility.

The proposed segments of this alternative are as follows:

- Begin Work – 1.4 miles south of L.A. Aqueduct Bridge, #48-10 (PM 29.9) The existing lanes would be rehabilitated for use as northbound and southbound lanes.
- 1.3 miles south of L.A. Aqueduct Bridge, #48-10 (PM 30.0) New northbound and southbound lanes will be constructed to the west of the existing highway and will pass west of Olancha and Cartago.
- 1.3 miles north of Whitney Street (PM 39.1) The existing lanes will be rehabilitated for use as northbound lanes and new southbound lanes will be constructed to the west.
- 2.3 miles north of Whitney Street (PM 40.1) The existing lanes will be rehabilitated for use as southbound lanes and new northbound lanes will be constructed to the east.
- End Work – 0.2 miles south of Ash Creek Bridge, #48-11 (PM 41.8)

This alternative would construct a four-lane divided expressway similar to Alternative 2. However, the location of the facility would be much higher on the alluvial fans west of Olancha and Cartago. As a result, there would be substantial changes from the existing profile and considerably more earthwork. The proposed alignment would also be about 1.5 miles longer and would require that SR 190 be extended approximately 1.1 miles to meet the proposed alignment. Due to the increases in length and earthwork, this alternative has the highest cost of all alternatives.

The existing highway would be converted to frontage road. The frontage road would begin near PM 30.4 and continue north along the existing alignment to join the proposed alignment north of Cartago.

The length of frontage road that would be relinquished to Inyo County would increase to 7.6 miles. The number of access points to the new expressway would be reduced to only three – the intersection with SR 190 and the southern and northern termini of the frontage road – and all existing roads would connect to the proposed frontage road.

This alternative would be west of the Los Angeles Aqueduct and would not enjoy the protection from alluvial flooding that the aqueduct currently provides. As a result, a significantly larger drainage network would be required to protect the roadway from potential flooding. It may even be necessary to construct drainage channels along the western boundary of the roadway to intercept and collect major storm flows.

This alternative would also require substantially more structures. Two bridges would be required to carry the southbound and northbound lanes across the Los Angeles Aqueduct west of Cartago. An additional bridge would also be required to carry the extension of SR 190 across the Los Angeles Aqueduct. There would also be a substantial increase in the number of box culverts. The proposed undercrossings would be constructed, and would meet an added need of providing access under the new facility for migrating deer. The proposed locations for box culverts are shown below:

<u>PM - Description</u>

31.3 - Dry Wash

32.0 - Dry Wash

34.7 - Olancha Creek

36.6 - S. Fork Cartago Creek

37.6 - N. Fork Cartago Creek

38.5 - Multi-purpose undercrossing

34.7 - Multi-purpose undercrossing (alternative site)

No Build Alternative

The “No Build” Alternative would leave this segment of U.S. 395 in its current configuration as a two-lane conventional highway. This would not address the project purpose and need to increase safety, improve level of service, and provide four-lane route continuity. As traffic volumes increase, the level of service will continue to deteriorate and the number of accidents would be expected to continue to increase. As a result, this alternative is not recommended.

Rejected Alternatives

<u>Alternative 3A</u>

As noted in the Project History Section, Alternative 3A was developed as a result of a Value Analysis Report (VAR) that was prepared for this project. This alternative would have passed to the west of both Olancha and Cartago, but would have stayed on the east side of the Los Angeles Aqueduct.

However, private development had increased along the proposed alignment for Alternative 3A since it was developed in 2000. Since Alternative 4 would have served the same purpose and would not require the take of the recently developed land, Alternative 4 was chosen over Alternative 3A. In addition, Alternative 3A would have had significantly higher noise and traffic impacts due to its proximity to the communities. As a result, Alternative 3A was rejected by the Project Development Team in the summer of 2007 in favor of Alternative 4.

Alternative 2R (*Design Option 2R*)

This alternative was the original alignment for Alternative 2 that was developed in early bypass studies and was included in the 1999 PSR-EO. It would have followed the same alignment as Alternative 2, except that the alignment would have continued past SR 190 (PM 34.6) on the east side of the existing highway up to about PM 35.6, where it would have crossed back over to the west of the existing highway. Since this alignment would significantly reduce the right of way impacts, the cost of construction, and some of the environmental impacts in northwestern Olancha, it was reevaluated during the consideration of alternatives for this project.

However, wetlands were determined to be present in the pasturelands north of SR 190 and east of the existing highway. Since jurisdictional wetlands must be avoided, this alternative was removed from consideration.

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

Memorandum

Serious drought!
Help save water!

To: JENNIFER LUGO
Associate Environmental Planner
Central Region Special Projects Branch

Date: December 22, 2014

File: INY-395 (PM 29.2/41.8)
09-21340

From: JUERGEN VESPERMANN
Senior Environmental Planner
Central Region Hazardous Waste and Paleontology Branch

Subject: Initial Site Assessment Update

A hazardous waste evaluation update was conducted. Information provided in previous ISAs is still valid. Therefore, no changes are necessary.

Visual Impact Assessment and Addendums

VISUAL IMPACT ASSESSMENT
for the
OLANCHA CARTAGO FOUR LANE PROJECT
U S 395 PM 29.2/41.8
INYO 09-213400

Prepared for
State of California Department of Transportation

Prepared by
R. Steve Miller, Landscape Architect
California Department of Transportation
Central Region
District 9, Bishop
January 20, 2010

This Visual Impact Assessment (VIA) evaluates the proposed Olancha/Cartago Four-Lane Project to improve US 395 from PM 29.2 to PM 41.8 in Inyo County as part of the Environmental Document. The proposed project will upgrade the existing two-lane conventional highway to a new facility with four 12-foot lanes and a variable median width. There will be 5-foot inside and 10-foot outside paved shoulders throughout the project. This project also proposes constructing new concrete bridges to cross the Los Angeles aqueduct, and installing concrete box culverts and smaller pipe culverts throughout the project limits to promote drainage. Depending on the alternative selected this project proposes to extend State Route 190 to intersect with the proposed improvements. The project covers approximately 12 miles. The project will improve the Level of Service, ease congestion, and improve overall safety of this portion of US 395. There are 5 alternatives in addition to the "no build."

The project area is not a designated State Scenic Highway. US 395 has long been recognized for its scenic qualities and is classified as part of the Eastern Sierra Scenic Byway by the Coalition for Unified Recreation in the Eastern Sierra (CURES.) This volunteer organization is dedicated to preserving the Eastern Sierra's natural, cultural, and economic resources and enriching the experiences of visitors and residents.

The route encompasses two distinct landscape units visible from the highway corridor: the sage scrub vegetation association, and the Cottonwood riparian association.

The visual resources of existing and post-construction conditions were analyzed based on field surveys and engineering data. Project construction may involve some substantial change to the visual resource. The visual impact assessment recommends measures to improve post construction visual quality.

The regional landscape consists of the topography, land cover, and man-made elements that set it apart from other regional landscapes. The visual character of a region's landscape features and the relationships between those features form the basis of our visual comprehension of the region. Visual character can be described objectively using visual attributes (form, line, color, texture) to derive visual patterns such as dominance, scale, diversity, and continuity (U.S. Dept. of Transportation, 1988: 37-43.)

This region can be described as where the high desert meets the high Sierra. Dominating the view are the Sierra Nevada mountains and especially Olancha Peak known as the "Southern Sentinel of the Sierras", with an elevation of 11,800 ft. There is no peak higher, further south in California. To the east is the dry lakebed of Owens Lake formerly the 2nd largest lake in California prior to water diversions into the Los Angeles aqueduct. Beyond the lake are the Coso and Inyo Mountain Ranges. Local streams draining from the Sierra Nevada, in particular Olancha and Cartago creeks flow east through the project area and originally terminated in Owens Lake. Most of these waters have been diverted into the Los Angeles aqueduct system, but there is still some seasonal flow to irrigated pastures west of the existing highway alignment.

Along this route, this area represents the northern range limit for the Joshua Tree (Yucca brevifolia) and Creosote Bush (Larrea tridentata) although it continues a little further north on the east side of the Owens Valley.

US 395 descends into this rural setting crossing State Route 190 the major western route into Death Valley, and passing through the towns of Olancha and Cartago.

The community of Olancha has survived for well over one hundred years with some form of business or industry. This longevity in itself makes it unique. Olancha is one of a number of small communities strung throughout the valley from Mojave to Bishop along the original stage trail from southern California, most roughly a day's travel by stagecoach apart.

Originally established as a farming and mining community, Olancha has developed a residential area in addition to the ranches. These scattered residential lots are primarily situated to the west of the existing highway and the ranches on the east. The ranches have pastureland on both sides of the highway. There are rows of cottonwood trees (Populus fremontii) growing around the two major ranches and extending up Olancha Creek to the west. The original settlers and ranchers planted these trees as shelter from the fierce wind and dust storms common to the area. Over the years (with the formerly high water table) they multiplied so that the main part of town is under the canopy of mature trees. In the fall, when the leaves turn golden, the area is a popular stopping place for artists and photographers using the brilliant colors as the foreground for striking pictures of the Sierra Nevada mountains and Olancha Peak.

A water bottling plant was erected on land just north of the town and produces "Crystal Geyser" bottled water from springs on the site. The facility consists of a few large metal warehouses surrounded by chain link fencing.

A few miles north of Olancha is the former town of Cartago. Created in 1872 as a steamship landing on the southwest shore of Owens Lake to handle shipments of silver bullion from the Cerro Gordo mine in the Inyo Mountains. Today it is a small community of residential properties for people seeking a quiet, rural lifestyle.

The native plant communities of the project are indicative of the overlapping of the Mojave Desert and Great Basin plant communities in this area. Visually this overlap is revealed by the prevalence of Joshua Trees (Yucca brevifolia) and Creosote Bush (Larrea tridentata) on the southern end of the project area and the absence of these plants in the northern end of the project where the saltbush scrub community begins (Atriplex species.) At the interface of this changeover is the area now dominated by Cottonwood Trees (Populus fremontii) and Willows (Salix species.)

Landscape units define the area in and around the proposed project being studied by this VIA. The landscape units define the distinct character at ground level. This VIA distinguishes two landscape units in the project area that the traveling public will experience as they move along the roadway.

The sage scrub vegetation with its neutral palette of colors accentuates the surrounding landforms from the ancient lakeshore up onto the fans of the steep mountain incline revealing the vastness of the landscape and creating the major landscape unit. In stark contrast the Cottonwood trees and Willows dotted along the creeks and in groves around the town of Olancha create a refuge of lush green foliage and create the second landscape unit.

Following recommended FHWA guidelines; the quality of the project's visual resources was analyzed for this assessment both before and after project construction. The best method for this VIA is to examine the relationships of the visual resources according to three criteria. Those are vividness, unity, and intactness of the view shed. The three criteria have been defined as (U.S. DOT, 1981: 13):

1. **Vividness**, the visual power of landscape components as they combine in striking and distinctive visual patterns;
2. **Unity**, the visual coherence and compositional harmony of the landscape considered as a whole; it frequently attests to the careful design of individual components in the landscape;
3. **Intactness**, the visual integrity of the natural and man-built landscape and its freedom from encroaching elements; this factor can be present in well-kept urban and rural landscapes, as well as in natural settings.

This project will have little impact on the visual quality of the surrounding regional view shed. Four-laning the roadway may actually allow the motorist a clearer view of the Sierra peaks, distant mountain ranges and lakebed. Uniform shoulder widths will provide the opportunity to safely stop.

Much of the visual impact from this project will result from the disturbance and removal of the native and ranch land vegetation that will occur during construction. Reestablishment of native sage scrub and grasses may take up to 5 years, trees up to 25 or more years with supplemental irrigation. Measures to protect and preserve existing vegetation will greatly enhance the post construction visual quality of this unique rural landscape.

Alternatives 1, 2 and 2A will result in the loss and degradation of mature Cottonwood trees. This review indicates that these trees located within the town of Olancha contribute to the rural visual quality of the area and have an effect on the spatial characteristics of the corridor. These trees and their associated habitat provide visual interest and are consistent with the look of a rural highway. Removal of these trees could result in an adverse visual impact to the highway user. Measures to protect selected trees and rows of trees in place will help blend the project site into the local landscape. The establishment and maintenance of these trees is an integral aspect of reinforcing the character of this unique setting.

The altering of landform either by cuts or fills has the potential to create permanent visual impacts. Measures to blend the alterations with existing topography will help to restore the scenic quality.

Through analysis and examination of the visual experience of moving through the view corridor, it is found that the existing high visual quality of US 395 and its surroundings is mostly due to the following:

- Exaggerated topographic relief.
- Native and Ranch land vegetation. The harmonious visual pattern of diverse vegetation in the overlapping plant communities of the project area.
- The dramatic vistas of the Sierra Nevada and Inyo Mountain ranges.
- The combination of alternating distant vistas and narrowing view sheds caused by the groves of Cottonwood trees and undulating landforms.

In order to maintain these visual quality elements and in order to decrease the amount of negative visual impact caused by the project, the following actions are recommended.

1. If Alternatives 1, 2, or 2A are selected, program and implement a separate project to replant trees and shrubs to ultimately improve and restore visual quality in the project area. The project shall include a combination of seeding and container planting of native vegetation. A minimum 3-year plant establishment period will be included to assure the success of the revegetation. Replacement of affected trees and shrubs shall be strategically located to blend with and enhance the existing plant communities.

2. When structures are used, consideration should be given to the selection of types, materials, colors, and textures to blend with the adjacent natural landscape components (soil, vegetation, rock etc.)

3. Cut and fill slopes to be contour graded to a non-uniform profile to blend with existing adjacent slopes. Slope grades will be constructed to facilitate planting, provide erosion control and ease of maintenance with increased slope rounding at the top and bottom of cuts and fills.

4. Consider the use of metal beam guardrail, or other safety methods to preserve selected rows of mature trees in lieu of recovery zone areas.

5. Collect and store topsoil/duff for placement on disturbed areas prior to replanting.

6. Replanting with native vegetation is critical for restoring visual quality. The native seed mix, application rates, and planting methods shall be determined by or approved in cooperation with a Caltrans Landscape Architecture representative.

7. Protect and preserve existing native vegetation.

With the implementation of the stated mitigation methods, the visual impacts of this project can be reduced and will not result in substantial changes in overall visual quality.

Visual objectives must be attainable and mitigation methods should be cost effective. The measures recommended in this assessment would preserve and restore the scenic assets along this section of US 395. This will enable the traveler to continue to experience and appreciate this unique rural setting where the high desert meets the high Sierra while improving mobility across California.

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State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

Memorandum

Flex your power!
Be energy efficient!

To: SUSAN SCHILDER-THOMAS
Senior Environmental Planner

Date: July 21, 2014

File: 09-INY-395
PM: 29.2/41.8
09-213400
09-0000-0030
Olancha/Cartago 4-Lane

From: JIM HIBBERT
District Landscape Architect
District 9 – Landscape Architecture

Subject: **Addendum to the Visual Impacts Assessment for the Olancha/Cartago 4-Lane Project.**

Project Description

The preferred alternative would construct a controlled access four-lane divided expressway for the entire length of the project. The new expressway would begin at the existing expressway south of Olancha near the crossing of Summit Creek and would be constructed on the west side of the Los Angeles Aqueduct and Olancha. After crossing Olancha Creek, the alignment would turn to the north to cross the Los Angeles Aqueduct and return to the existing alignment. From there, the expressway would follow the existing alignment through Cartago and north to the end of the project.

The proposed segments of this alternative are as follows:

- **SEGMENT 1** – After separating from the existing roadway the new northbound and southbound lanes would be constructed west of the existing highway and would travel west of Olancha and the Los Angeles Aqueduct. After crossing Olancha Creek, the new lanes would cross the Los Angeles Aqueduct and return to the existing alignment south of Cartago.
- **SEGMENT 2** – New northbound and southbound lanes would be constructed west of the existing highway and would pass through Cartago between the existing highway and Pine Street.
- **SEGMENT 3** – The existing lanes would be rehabilitated for use as the northbound lanes and new southbound lanes would be constructed to the west. The southbound lanes would diverge to the west to avoid an existing utility corridor.
- **SEGMENT 4** – The southbound lanes would return to the northbound lanes and the existing lanes would be rehabilitated for use as the southbound lanes. New northbound lanes would be constructed to the east. The proposed roadway would then connect to the existing 4 lane separated freeway at the northern project limits.

VISUAL RESOURCES AND RESOURCE CHANGE

Visual resources of the project setting are defined and identified below by assessing *visual character* and *visual quality* in the project corridor. *Resource change* is assessed by evaluating the visual character and the visual quality of the visual resources that comprise the project corridor before and after the construction of the proposed project.

Visual character is described as the elements of form, line, texture, and color of a visual resource, combined with that visual resource's characteristics of dominance, scale, diversity, and continuity (USDA Forest Service 1974; Federal Highway Administration 1983). Both natural and artificial landscape features compose the character of an area or view. Both natural and artificial landscape features contribute to perceived visual images and the aesthetic value of a view. Geologic, hydrologic, botanical, wildlife, recreational, and urban features influence aesthetic value. The perception of visual character—visual images and their perceived quality—can vary significantly seasonally and even hourly as weather, light, shadow, and the elements that compose the viewshed change. The appearance of the landscape is described in terms of the dominance of each of these components.

The visual character of the proposed project will be compatible with the existing visual character of the US Highway 395 corridor in southern Inyo County. The visual character of the southern Owens Valley consists of Creosote Brush Scrub covered high desert surrounded by large mountains that rise up to 10,000 feet above the mostly flat valley floor. The waist high vegetation on the valley floor provides for expansive views of the surrounding mountains. Human development is spread out in small clusters that are mostly located at the base of the Sierra Nevada Mountains along the western edge of the valley floor. Most of the buildings in these small communities visually appear to be of uninteresting architecture and poorly maintained. Formal landscaping is minimal and most yards consist of native vegetation and scattered personal possessions. These communities are tied together by the US Highway 395 corridor which mostly consists of a 4 lane divided freeway with north and southbound lanes separated by an average of a 100 foot median which is vegetated with native Creosote Brush scrubland. This project will upgrade the existing two lane highway to a 4 lane divided freeway which matches the existing highway it connects with from the north and south. The proposed roadway design will include medians and roadside cut/fill slopes that may slightly affect the existing visual character of the area until native re-vegetation becomes established. The proposed cut and fill slopes may be larger in scale to existing cut and fill slopes along the US Highway 395 corridor within the Owens Valley. The proposed alignment will include wide medians that range from 100 feet to 600 feet will allow the northbound and southbound alignments to visually blend into the natural topography.

Visual quality is evaluated based on the relative degree of vividness, intactness, and unity apparent in a viewscape as modified by its visual sensitivity. Vividness is the visual power or memorability of landscape components as they combine in visual pattern. Intactness is the visual integrity of the natural and artificial landscape and its freedom from encroaching elements. This factor can be present in urban and rural landscapes, as well as in natural settings. Unity is the visual coherence and compositional harmony of the landscape considered as a whole. It frequently attests to the careful design of individual components in the artificial landscape. High-quality views are highly vivid and relatively intact, and exhibit a high degree of visual unity. Low-quality views lack vividness, are not visually intact, and possess a low degree of visual unity. The measure of the quality of a view must be tempered with overall sensitivity of the viewer.

The visual quality of the US Highway 395 corridor in the Owens Valley is extremely high. The combination of the Sierra Nevada Mountains to the west, the flat Owens Valley floor, native Creosote Brush Scrubland vegetation cover and the US Highway 395 corridor that has been designed to blend into the natural contours creates a picturesque landscape that attracts visitors from around the country and world. The visual quality is slightly reduced in the towns of Olancha and Cartago where development is not of a high aesthetic level.

Resource Change (changes to visual resources as measured by changes in visual character and visual quality) will be moderately low. The key visual resource within the project limits is the dramatic Sierra Nevada Mountains to the west. This project will not create structures or roadway grades that will block views of the mountains from the communities of Olancha and Cartago. Views of the mountains to the west from the proposed alignment may be briefly blocked where roadside cut slopes will be excavated.

VIEWERS AND VIEWER RESPONSE

Neighbors (people with views *to* the road) and *highway users* (people with views *from* the road) will not be affected by the proposed project.

For this project the following highway users were considered: tourists, local commuters, long distance travelers and interstate truckers. Neighbors include residential, industrial and commercial development located on both sides of the roadway. Most if not all of the development has occurred after the existing US Highway 395. The roadway and its vehicular traffic are visible from most highway neighbors unless landscaping has been planted for privacy. For local residents and business people, views of the roadway and its passing traffic are unnoticed. Most of the visual attention for both highway neighbors and users is focused on the large Sierra Nevada Mountains to the west, and to the east the Owens Valley in the foreground and middleground and the Coso and Inyo Mountains towards the eastern horizon. The proposed 4 lane divided highway will not affect views of the mountains.

For highway users, their response to the change from existing conditions will be an improvement. The new alignment will bypass the town of Olancha to the west and they will experience improved views of the natural environment (mountains and valley) instead of visually uninteresting development. In the community of Cartago, highway users will see a wider highway corridor with development located farther from the traveled way compared to current conditions. To the north, the new freeway corridor will visually match previously widened portions of the US Highway 395 corridor.

VISUAL IMPACT

Visual impacts are determined by assessing changes to the visual resources and predicting viewer response to those changes. The overall visual impacts of the project will be moderately low.

Visual impacts created by the project in **Segment 1** which extends from the southern limits of the project to the town of Cartago will be low to moderate. The proposed highway alignment will cross over the Los Angeles Aqueduct and parallel the waterway to the west. Throughout segment 1, a majority of the north and southbound lanes will be elevated above the ground at an average of 15 feet which improves views of the mountains and Owens Valley. Local topography will require two cut slopes that will have a maximum height of 70 feet. The traveling public will briefly lose views of the surrounding landscape in these locations.

For residents of the town of Olancha, the only portions of the new roadway visible will be where the roadway is elevated atop fill slope. It will visually mimic the Los Angeles Aqueduct which will be located slightly closer in the middleground. What would be visible will be similar in horizontal form to the existing aqueduct. As native revegetation becomes established, the new highway alignment will be barely noticeable to local residents. For the traveling public, the visual quality on the new highway alignment will be improved as the roadway will be relocated to the west at a higher elevation, closer to the scenic mountain range. Views to the east of the Owens Valley will be improved since the highway will be higher in elevation that the old alignment. Travelers will have reduced views of the town of Olancha which consists of uninteresting architecture and scattered development.

Visual impacts created by the project in **Segment 2** will be moderate._ The proposed alignment will be west of the existing US Highway 395 in an area that is undeveloped except for an abandoned industrial building located adjacent to the existing roadway. This structure will be removed to allow for construction of the highway. The proposed northbound and southbound lanes will visually divide the main part of the town of Cartago from a small neighborhood located to the west that consists of residences and horse stables located centered around the Pine Street area. Including the existing highway there will be three two-lane corridors separated by approximately 100' wide medians and shoulders. The medians and shoulders will be re-vegetated with native species common in the Creosote Brush scrubland. Views of the Sierra Nevada Mountains towards the west from the town of Cartago will not be impacted since the roadway will be constructed at grade.

Visual impacts created by **Segment 3** will be low. The proposed alignment follows the existing highway with southbound lanes constructed towards the west. The median separating the northbound and southbound lanes will widen to approximately 650 feet to avoid a mainline utility corridor which connects the Northwestern US to Southern California. There will be cut slopes north of the town of Cartago and a larger cut slope with a maximum height of 20 feet where the northbound and southbound lanes meet up at the northern end of the wide median area. There is no residential or commercial development along this portion of the highway.

Visual impacts created by **Segment 4** will be low. Like Segment 3, the proposed alignment follows the existing highway with the new northbound lanes constructed towards the east. The median separating the northbound and southbound lanes will be approximately 100 feet in width. There is no residential or commercial development along the final portion of the highway although the mainline utility corridor will be visible in the foreground to the west.

AVOIDANCE AND MINIMIZATION MEASURES

Avoidance or minimization measures have been identified and can lessen visual impacts caused by the project. Also, the inclusion of aesthetic features in the project design previously discussed can help generate public acceptance of a project. This section describes additional avoidance and/or minimization measures to address specific visual impacts. These will be designed and implemented with concurrence of the District Landscape Architect.

The following measures to avoid or minimize visual impacts will be incorporated into the project:

1. All medians and roadside areas should be revegetated with plant species found in the Creosite Brush scrubland.

2. Cut and fill slopes should be contoured to help visually blend in with the surrounding landscape. Rounding the top and bottom of cut and fill slopes should be considered.

If you have any questions or need further information, please contact Jim Hibbert, District 9 Landscape Architect at (760)872-0783.

Relocation Impact Statement

State of California
DEPATMENT OF TRANSPORTATION

California State Transportation Agency

Relocation Impact Statement

(Exhibit 10-EX-3A; rev. 12/2005)

To : CEDRIK ZEMITIS
Project Manager – Bishop 760-872-5250

Date: October 7, 2013

File: Inyo 395-PM29.2/41.8

Attention : Brian Wesling, Design Manager –Bishop
Susan Schilder, Sr. Enviro Planner - Fresno
Barbie Barnes, Sr. RW Agent, RAP – Fresno

Fed Aid No. N/A
Const Fed Aid N/A

From : **Department of Transportation**
Right of Way, Central Region – Bishop

EA 09-213400
Project No. 09-0000-0030

Subject : Relocation Impact Statement for the Preferred Alternative, which is a combination of Alternatives 3 and 4, for the project called "Olancha-Cartago 4-lane" that is located in Southern Inyo County on State Route 395 between the town of Lone Pine and the city of Ridgecrest, which is home to the China Lake Naval Weapons Center. Caltrans proposes to convert approximately 11 miles of existing two-lane conventional highway into a controlled access four-lane divided highway. The project will provide route continuity by connecting into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

1. Purpose of the Relocation Impact Statement:

The purpose of this Relocation Impact Statement is to provide the Department of Transportation, local agencies and the public with information on the impact this proposed Preferred Alternative of the four-lane project will have on residential and non-residential occupants. Any relocation impacts within the Preferred Alternative area of the project limits appear to be non-complex and if needed, adequate relocation resources are available for any displacements. All displacees will be treated in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and the California Relocation Act.

2. Summary of Residential and Non-Residential Displacements for the Preferred Alternative:

	Preferred Alternative
Single Family Units	None
Mobile Homes	None
Multi-family Units	None

Estimated Total of Residential Displacements **(Unit/Residents)**	0 units 0 residents (0/0)
Non-residential Displacements **(Business/Employees)**	1 business; storage/warehouse facility (1/0)

The estimate of potential residential displacements is based on an average of 3.0 residents per household as determined by the Department of Finance Demographic Research Unit for January 2005 for Kern County, nearest information found to Inyo County. The estimate of potential non-residential displacements is based on a visual survey. The business establishment reviewed resembled a storage-warehouse type facility with no employees present. The facility itself appeared closed-down, not active or abandoned, and was in poor condition.

3. Summary of Relocation Resources Available to Non-Residential Displacees:

	For Rent	For Sale	Total Units
Industrial/Commercial Properties	0	4	4
Vacant parcels, both residential and commercial	0	11	11

4. Statement of Findings:

The information found, at the time of this report, is outlined in above graph. It shows that there are resources available for any non-residential displacements due to the design of the Preferred Alternative. A thorough review of the real estate market was performed for the area surrounding the project limits which includes Olancha, Cartago, Lone Pine, Inyokern and Ridgecrest. The nearest full-service communities to the project area is the town of Lone Pine to the north, and City of Ridgecrest to the south, with the city of Ridgecrest being the largest. Multiple listings were provided by Coldwell Banker Best Realty - Ridgecrest Office, and by Blue Sky Real Estate - Lone Pine Office.

5. Uniform Acquisition and Relocation Policy

All displacees will be contacted by a Relocation Agent, who will ensure that eligible displaces receive their full relocation benefits, including advisory assistance, and that all activities will be conducted in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies of 1970, as amended. Relocation resources shall be available to all displacees free of discrimination. At the time of the first written offer to purchase the owner-occupants are given a detailed explanation of Caltrans "Relocation Program and Services". Tenant-occupants of properties to be acquired are contacted soon after the first written offer to purchase is made, and are also given a detailed explanation of Caltrans "Relocation Program and Services". In accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, Caltrans will provide relocation advisory assistance to any person, business, farm, or non-profit organization displaced as a result of the acquisition of real property for public use.

Updated Relocation Impact Statement for the Preferred Alternative on the proposed "Olancha-Cartago 4-Lane Project", State Route 395 in Inyo County, EA: 09-213400, Project No. 09-0000-0030, has been completed and is recommended for approval by the undersigned:

Prepared by: Lora Rischer 10/7/2013
LORA RISCHER date
Associate Right of Way Agent
Right of Way, Central Region -Bishop

The undersigned has reviewed and approve this Updated Relocation Impact Statement for the Preferred Alternative:

Approved by: N Escallier 10/7/13
NANCY ESCALLIER date
Field Office Chief, Right of Way
Central Region – Bishop Field Office

Paleontological Identification Report

Paleontological Evaluation Report

PALEONTOLOGICAL IDENTIFICATION REPORT

Olancha/Cartago Four-Lane

09-INY-395-PM 29.2/41.8

EA 213400

March 24, 2010

PALEONTOLOGICAL IDENTIFICATION REPORT

Olancha/Cartago Four-Lane

09-INY-395-PM 29.2/41.8

EA 213400

March 24, 2010

Prepared By: Peter A. Hansen Date: March 24 2010

Peter A. Hansen, Paleontology Coordinator
California Professional Geologist # 7664
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PROFESSIONAL GEOLOGIST
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No. 7664
STATE OF CALIFORNIA

Approved By: Date: 3/24/10

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For individuals with sensory disabilities this document is available in alternate formats. Please call or write to Juergen Vespermann, Department of Transportation, 2015 East Shields, Suite 100, Fresno, CA 93726. 559-243-8157 Voice, or use the CA Relay Service TTY number 1-800-735-2929.

SUMMARY

This report is a Paleontological Identification Report (PIR) that describes the geology and potential paleontological resources of the Olancha/Cartago Four-Lane project area. This report is being prepared because a review of paleontological databases and a paleontology study of the project site identified the presence of paleontological resources in the project area that might be affected by project excavation. Since those initial studies were completed in 2000, project alternatives have been modified or added, including a borrow site that will provide fill for all project alternatives. The scope of this report includes a literature search and review of published geologic and paleontologic information. This report covers all five build alternatives and the no-build alternative of the current project.

Olancha Cartago Four-Lane project alternatives follow along the existing U.S. Highway 395 on the west side of the Owens Valley between Owens Lake and the Sierra Nevada. The Sierra Nevada lies to the west, and the Inyo Mountains and Coso Range lie to the east. The project area is in the U.S.G.S. Bartlett, Olancha, Vermillion Canyon, Haiwee Pass, and Haiwee Reservoirs 7.5 min. quadrangles. Elevations in the project area range from about 3500 feet above sea level at Owens Lake to over 12,000 feet above sea level in the Sierras to the west. Alternatives 1, 2, 2A, and 3 would be constructed east of the Los Angeles Aqueduct on relatively flat ground between about 3600 feet and 3800 feet above sea level on the toes of alluvial fans that flow out into the Owens Valley. Alternative 4 is further west and would be constructed on higher ground between about 3600 feet and 4000 feet above sea level west of the Los Angeles Aqueduct. Successive alternatives are higher on the alluvial fans with Alternative 1 closest to the Owens River and Alternative 4 furthest west and highest.

The Olancha Cartago Four-Lane project is located in the Basin and Range geomorphic province. Pre-Cenozoic granitic and metamorphic rocks and Mesozoic granitic rocks of the Sierra Nevada lie to the west of the project. Quaternary lake deposits lie just to the east of the project alternatives. The project alternatives are underlain by Quaternary sedimentary deposits. These deposits are primarily a heterogeneous mixture of unconsolidated to moderately consolidated gravel, sand, silt, and clay. Changing depositional environments during the filling of the valley have created a complex arrangement of irregular overlapping and interfingering lenses and layers of fluvial, lacustrine, alluvial fan, littoral, deltaic, colluvial, and glacial deposits. Later reworking and redeposition of some parts of the valley fill by fluvial and beach processes has further complicated interpretation of the sedimentary sequences. Alluvial fan deposits interfinger with fluvial and lacustrine deposits. Fossils specimens recovered from localities near the Olancha/Cartago Four-Lane project area appear to be primarily from the fluvial and lacustrine deposits of Owens Valley.

University of California Museum of Paleontology (UCMP) localities near the project area include Green Velvet 3 (V67136) ¾ mile west of Olancha from which a specimen of *Equus* (horse) was recovered, and Zurich 1 and 2 (UCMP 1764-1765) near Big Pine in lacustrine sediments . The Los Angeles County Museum of Natural History (LACM) has three localities in the area from Quaternary sediments. Two localities at Haiwee Reservoir, LACM 3514 and 4538, produced specimens of *Mammuthus* sp. and a locality at Lone Pine Southeast (Owens Lake), LACM 4691, produced specimens of Felidae, Proboscidea, *Equus* sp. and Camelidae. A paleontology study for an Environmental Impact Report prepared for the Great Basin Unified Air Pollution Control District reported a number of fossils recovered from Owens Lake bed sediments. Additional nearby Quaternary vertebrate sites in Inyo County include a San Bernardino County Museum locality at Owens Lake East, SBCM 6.6.3-6.6.4, that produced specimens of *Equus* sp., *Camelops* sp. and *Bison* sp.

A Paleontological Evaluation Report is required to assess the impact to paleontological resources and determine the significance of any impact. Construction excavation for the Olancha/Cartago Four-Lane project would require excavation for the roadway structural section, and various structures. All build alternatives would require fill that would be supplied by excavation from a borrow site within the project limits. Major, deep construction excavation for this project appears likely to impact the Quaternary fluvial and lacustrine sediments known to contain fossils of scientific interest. Under Caltrans guidelines published online in the Caltrans Standard Environmental Reference (Caltrans, 2009), rock units which, based on previous studies, contain or are likely to contain significant vertebrate, significant invertebrate, or significant plant fossils are classified as High Potential. Areas with a high potential for containing significant paleontological resources require monitoring and mitigation.

Bureau of Land Management (BLM) property underlies portions of all project alternatives and a permit will be required for paleontology mitigation activities. The Los Angeles Department of Water & Power and the State Lands Commission also own land in the project area (Caltrans, 2008b), and permits or written permission may be required if this land will not be purchased by Caltrans. Alternative 4 may also impact US Forest Service land and a permit from the US Forest Service would be required.

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LIST OF ABBREVIATED TERMS

BLM	U.S. Department of the Interior, Bureau of Land Management
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGS	California Geological Survey (California Division of Mines and Geology)
CSUF	California State University, Fresno
FHWA	Federal Highway Administration
LACM	Natural History Museum of Los Angeles County
NEPA	National Environmental Policy Act
PER	Paleontological Evaluation Report
PIR	Paleontological Identification Report
PL	Public Law
PM	Post Mile
PMP	Paleontological Mitigation Plan
PMR	Paleontological Mitigation Report
PSS	Paleontological Stewardship Summary
UCMP	University of California Museum of Paleontology

KEY WORDS

Bartlett Quadrangle
Cartago
Coso Range
Haiwee Pass Quadrangle
Haiwee Reservoirs Quadrangle
Inyo County
Inyo Mountains
Lone Pine
Olancha
Olancha Quadrangle
Owens Lake
Owens Valley
Sierra Nevada
Vermillion Canyon Quadrangle

INTRODUCTION

The California Department of Transportation and the Federal Highway Administration proposes to convert approximately 12.6 miles of the existing two-lane conventional highway into a four-lane expressway or partial conventional four-lane highway from post miles 29.2 to 41.8 in Inyo County. A project vicinity map and location map are located in appendix II. The project proposes 5 alternatives with some on new alignments. Maps showing the locations of the alternatives are in appendix II. Portions of the existing road may be used as part of the proposed alternatives, relinquished to the county, or removed. The new facility would have four 12-foot lanes and a variable median width. There will be 5-foot inside and 10-foot outside paved shoulders throughout the project. This project also proposes constructing new concrete bridges to cross the Los Angeles Aqueduct, and installing concrete box culverts and smaller pipe culverts throughout the project limits to promote drainage. Depending on the alternative selected, this project proposes to extend State Route 190 to intersect with the proposed improvements. A borrow site at the end of Fall Road and south of Olancha Creek would be used to provide soil and road materials for all project alternatives.

Alternatives

Five build alternatives and the "no-build" alternative are proposed for evaluation and study, and may include slight variations. Briefly, these are described as follows:

<u>Alternative 1</u>

Alternative 1 would construct segments of conventional all-paved, conventional divided, and controlled access four-lane divided highway. This alternative would connect into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

<u>Alternative 2</u>

Alternative 2 would construct a controlled access four-lane divided expressway with the northbound and southbound lanes separated by at least a 100-foot-wide median throughout the project. This alternative would connect into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north.

<u>Alternative 3</u>

Alternative 3 would construct a controlled access divided four-lane expressway to the west of the community of Olancha with the northbound and southbound lanes separated by at least a 100-foot-wide median throughout the project. This alternative would connect into the Sage Flat Four-Lane to the south and the Ash Creek Four-Lane to the north. Throughout the project inside shoulder width would be 5 feet and outside will be 10 feet.

<u>Alternative 4</u>

Alternative 4 would construct a new alignment west of the Los Angeles Aqueduct. A 4-lane divided expressway with a 100-foot median would be constructed from PM 29.75 to the northern limit of Cartago. North of Cartago the median would be 100 feet or wider so as to thread existing utilities. The new road would bear west of the current alignment near PM 29.75 and tie in approximately with the old railroad grade. The road would continue north along the west side of the Los Angeles aqueduct. At a point just west of Cartago the road would bridge the aqueduct and angle back toward the current alignment. North of PM 38.6 Alternative 4 will become similar to the other alternatives.

<u>No Build Alternative</u>

The No Build Alternative would leave the facility as it currently exists. This alternative does not provide relief from the existing deficiencies or address the operational improvements this project seeks to deliver.

Project Impact Area

The Olancha/Cartago Four-Lane project alternatives follow along the existing U.S. Highway 395 on the west side of the Owens Valley between Owens Lake and the Sierra Nevada. The project area impacted by the five alternatives as described above is shown on the figures in appendix II. The NASA (2010) photo in appendix II shows the southern Sierra Nevada and Owens Lake in a view west across Owens Valley. The Sierra Nevada lies to the west, and the Inyo Mountains and Coso Range lie to the east (Matthews and Burnett, 1965; Streitz and Stinson, 1974). The project area is in the U.S.G.S. Bartlett, Olancha, Vermillion Canyon, Haiwee Pass, and Haiwee Reservoirs 7.5 min. quadrangles. Elevations in the project area range from about 3500 feet above sea level at Owens Lake to over 12,000 feet above sea level in the Sierras to the west. Alternatives 1, 2, 2A, and 3 would be constructed east of the Los Angeles Aqueduct on relatively flat ground between about 3600 feet and 3800 feet above sea level on the toes of alluvial fans that flow out into the Owens Valley. Alternative 4 is further west and would be constructed on higher ground between about 3600 feet and 4000 feet above sea level west of the Los Angeles Aqueduct. Successive alternatives are higher on the alluvial fans with Alternative 1 closest to the Owens River and Alternative 4 furthest west and highest.

Regulatory Setting

Caltrans protects and enhances the environment and quality of life in accordance with the environmental, economic and social goals of California (Caltrans, 1992). Caltrans evaluates the environmental benefits and consequences of its activities and implements practices that minimize environmental impacts. Caltrans, as part of the project development and delivery process, is obligated to conduct paleontological studies in response to Federal, State, and local laws, regulations, and ordinances (Caltrans, 2009).

Paleontology is the study of life in past geologic time based on fossil plants and animals. Fossils furnish information about the kinds of plants and animals that existed, when they appeared and vanished, where and how they lived, and the type of environments they preferred (CGS, 2002, Note 51). Fossils help us to learn how species evolved, how some descended from others, and how groups of organisms are related.

It is the policy of the United States that the public lands be managed in a manner that will protect the quality of scientific and historical values (BLM, 1998). The paleontological resources found on the public lands are recognized as constituting a fragile and nonrenewable scientific record of the history of life on earth, and so represent an important and critical component of America's natural heritage.

Construction of this project will be funded in part by the United States Department of Transportation. The Federal Aid Highway Act of 1956 (PL 84-627) and 1958 (PL 85-767) specifically extends the Antiquities Act of 1906 (PL 59-209) to apply to paleontological resources on highway projects funded by the Highway Act and authorizes the use of Highway Act funds for paleontological salvage to the extent approved as necessary by the State Highway Department. (Pub. L. 85-767, Aug. 27, 1958, 72 Stat. 913; Pub. L. 86-657, Sec. 8(e), July 14, 1960, 74 Stat. 525. See also 23USC305.) The Antiquities Act protects objects of antiquities and requires that properly qualified institutions and experts carry out any investigations. Typical federal requirements for paleontological resource management for compliance with the Antiquities Act are outlined in Bureau of Land Management Manual Section 8270 (BLM, 1998).

The National Environmental Policy Act (NEPA) requires the identification and assessment of reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment and the use of all practicable means, consistent with the requirements of the Act and other essential considerations of national policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment (40 CFR Part 1500.2 Policy).

The California Environmental Quality Act (CEQA) and Public Resources Code Section 5097.5 protect paleontological resources in California. CEQA requires that public agencies not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects (Chapter 1, Section 21002). California Public Resources Code 5097.5 protects vertebrate paleontological sites, including fossilized footprints or any other paleontological features situated on public lands. Requirements for paleontological studies and mitigation for Caltrans projects are detailed in the Caltrans Standard Environmental Reference, Volume 1, Chapter 8 - Paleontology (Caltrans, 2009).

Studies Required

The studies required for project-related paleontological resource efforts involve three steps that include identification, evaluations, and, as necessary, mitigation (Caltrans, 2009). These three steps generally entail preparation of 5 separate documents that are:

A Paleontological Identification Report (PIR)
A Paleontological Evaluation Report (PER)
A Paleontological Mitigation Plan (PMP)
A Paleontological Mitigation Report (PMR)
A Paleontological Stewardship Summary (PSS)

A Paleontological Identification Report (PIR) first determines the potential for a Caltrans project to impact paleontological resources. If the proposed project involves ground disturbance, there may be the potential to impact paleontological resources. A PIR is prepared to assess the potential for resources to be impacted by the project. Concurrent with the writing of the environmental document, qualified personnel will prepare a Paleontological Evaluation Report (PER) and Paleontological Mitigation Plan (PMP), if needed.

<u>Preparer Qualifications</u>

Mitigation is an eligible Federal project cost, in accordance with the Federal Aid Highway Act of 1956 (PL 84-627) and 1958 (PL 85-767). Federal funds are authorized to the extent determined as necessary by the state highway department, provided that the state is in compliance with the Antiquities Act of 1906 (PL 59-209). Documentation acceptable to FHWA must be submitted. The Antiquities Act requires that any investigations be undertaken by properly qualified institutions and experts as determined by the Secretaries of Interior, Agriculture, and War.

Bureau of Land Management Manual Section 8270 (BLM, 1998) provides detailed procedures and standards for paleontological resource management for compliance with the Antiquities Act. BLM qualifications for conducting paleontology assessments are similar to Caltrans requirements for a qualified Principal Paleontologist as outlined in the Caltrans Standard Environmental Reference, Volume 1, Chapter 8 - Paleontology, Preparer Qualifications (Caltrans, 2009).

The determination of a project's potential impact on paleontological resources and the significance of any impact will necessarily be based on the identification of geologic strata that will be affected by excavation and an assessment of the extent of the impact to the geologic strata. This will require professional investigation, analysis, and interpretation of the project area geology. California Business and Professions Code, Chapter 12.5, requires that such geologic reports prepared for public decision making documents be prepared by a California licensed Professional Geologist, or by a subordinate employee under his or her direction.

SCOPE OF STUDY

Purpose and Need

This report is a Paleontological Identification Report (PIR) that describes the geology and potential paleontological resources of the Olancha/Cartago Four-Lane project area. This report is being prepared because a review of paleontological databases (CSUF, 2000a) and a paleontology study (CSUF, 2000b) of the project site identified the presence of paleontological resources in the project area that might be affected by project excavation. Since those initial studies were completed in 2000, project alternatives have been modified or added, including a borrow site that will provide fill for all project alternatives.

The purpose of this investigation is to identify paleontological resources at the project site that might be impacted by project construction. This study identifies the project area's geology, stratigraphy, known or reasonably anticipated paleontological resources within the project area, and extent of project excavation to provide the framework necessary to determine what, if any, additional studies are required.

The actual assessment of the significance of any impact to paleontological resources is accomplished by a Paleontological Evaluation Report (PER) prepared with the assistance of a qualified principal paleontologist. If it is determined that a paleontological resource may be impacted by the project, it is necessary to determine the significance of the resource and the impact to it. The PER will identify the recommended course of action for any mitigation and estimate mitigation costs.

Study Methods

The scope of this report includes a literature search and review of published geologic and paleontologic information. This report covers all five build alternatives and the no-build alternative of the current project. This investigation also includes a review of: The University of California, Berkeley, Museum of Paleontology database (UCMP, 2010); The California State University, Fresno, Department of Geology Paleontological Sensitivity Mapping Project database (CSUF, 2000a); a paleontology study of the project area (CSUF, 2000b); a preliminary report on phase II investigations of prehistoric sites in the project area (Byrd, B.F., and Hale, M., 2002); geologic maps; and geologic and paleontologic literature. Mr. Hansen is a Caltrans Engineering Geologist in the Central Region Hazardous Waste and Paleontology Branch and has done paleontology assessment and mitigation work for the past nine years. Mr. Hansen is California Professional Geologist No. 7664.

Previous Paleontology Studies
California State University, Fresno Geology Department conducted a paleontology study in the project area for the Olancha/Cartago Four-Lane project (CSUF, 2000b, see appendix I). The result of that study is incorporated into this Paleontological Identification Report (PIR). Dr. Robert Dundas, California State University, Fresno, conducted the paleontology studies. Dr. Dundas is a geologist and vertebrate paleontologist with a Ph.D. in Paleontology from the University of California at Berkeley and has over fourteen years experience in paleontology assessments. He has held positions as Editor of PaleoBios and Senior Museum Preparator for the University of California Museum of Paleontology. He has been a Lecturer at the University of California at Berkeley and San Francisco State University. He is currently Assistant Professor in the Department of Earth and Environmental Sciences, California State University, Fresno. Dr. Dundas has worked extensively on fossil locations in the San Joaquin Valley including the Madera County Fairmead Landfill (Dundas, 2009).

A record search for fossil sites within the project area was conducted at the University of California Museum of Paleontology at Berkeley (UCMP) by Dundas (CSUF, 2002b). After reviewing the geologic maps, consulting the UCMP locality records, and conducting a field examination of the project area, sensitivity levels were assigned to the project area and plotted on USGS 7.5 minute topographic maps covering the project area.

Limitations
This PIR is based on previous studies and published geologic reports. The assessment of which geologic formations will be impacted is believed to be reasonable and accurate based on existing mapping. The extent to which scientifically important fossils will actually be encountered during construction excavation cannot be determined until excavation begins and the sensitive strata are exposed. The assessment of any potential impact to fossil resources is best accomplished through an understanding of the geologic framework of the project area and defining paleontological resources as the fossil bearing geologic formations.

AFFECTED ENVIRONMENT

Regional Geology
The Olancha Cartago Four-Lane project is located in the Basin and Range geomorphic province (Jenkins, 1943; CGS, 2002, Note 36). Pre-Cenozoic granitic and metamorphic rocks and Mesozoic granitic rocks of the Sierra Nevada lie to the west of the project (Matthews and Burnett, 1965). Quaternary lake deposits lie just to the east of the project alternatives. The project alternatives are underlain by Quaternary alluvium. A geologic time scale showing relative geologic ages is included in appendix II. This discussion of project area geology is primarily from Hollett and others (1991) except as where noted.

Owens Valley is a long narrow valley in the within the western part of the Great Basin section of the Basin and Range province (Hollett and others, 1991). The Great Basin section consists of linear, roughly parallel north-south mountain ranges separated by valleys, most of which are closed drainage basins. The Owens Valley basin extends from Haiwee Reservoir in the south, northward to include Round, Chalfant, Hammil, and Benton Valleys. The location of Owens Valley and a photo of the Southern Sierra Nevada and Owens Lake are shown in appendix II. The granitic and volcanic Coso Range forms a barrier at the south end of Owens Valley and prevents down stream flow of Owens River.

The Sierra Nevada to the west consists primarily of uplifted granitic and metamorphic rocks. The Inyo Mountains to the east consist of Paleozoic sedimentary rocks intruded by granitic plutons. The valley floor is underlain by thick sequences of unconsolidated to moderately consolidated alluvial fan, transition-zone, glacial and talus, and fluvial and lacustrine deposits intercalated with and overlain by Quaternary volcanic rocks. Basin and Range faulting, which followed early Cenozoic uplift and erosion in the late Tertiary, produced the present Owens Valley structure. Basin and Range faulting is characterized by north-south-trending normal faults that delineate the edges of the mountain ranges and valleys in the western part of the Great Basin section. Faulting migrated westward and reached Owens Valley between 3 and 6 million years ago. A map showing the location of the Owens Valley fault zone and a generalized geologic map of the Owens Valley drainage basin are included in appendix II.

Periods of alpine glaciation produced abundant glacial deposits transported into Owens Valley where the deposits form part of the valley fill. These periods of glaciation during the Pleistocene and Holocene in the Sierra Nevada have been dated at 3.2 million years to as recent as 400 years ago. Owens Valley is the final depository of sediments eroded from the surrounding highlands. Owens Valley, located at the base of many glaciers in the Sierra Nevada, was a sediment trap for the Pleistocene Owens River drainage basin area. The present Owens Lake is a remnant of the more extensive Pleistocene Lake Owens, which occupied Owens Valley during pluvial stages.

During the pluvial stages of the Pleistocene, the Owens River drainage system extended to Lake Searles at various times, over flowing the Owens basin at Haiwee meadows (now Haiwee Lakes) at the south end of the valley. Water-level fluctuations in Lake Owens caused broad shifts in the depositional environment across the gentle slope of the valley floor. The lowest natural outlet of Pleistocene Lake Owens or the present Owens Lake is controlled by the altitude of the gorge at Haiwee Reservoir. Geologic reconstruction of the alluvial fan surface at Haiwee Reservoir is put by Hollett and others (1991) at about 3865 ft above sea level prior to down cutting of the gorge by the Pleistocene Owens River, and Pleistocene beach terrace levels from Lake Owens at about from 3790 ft to 3860 ft above sea level.

Shore line fragments and beach stratigraphy mapped by Orme and Orme (2008) indicate the highest beaches of Lake Owens during the late Pleistocene (23.5 ka) range in elevation of 3740 ft (1140 m) to 3829 ft (1167 m) above sea level. Jayko and Bacon (2008) also describe the location and characteristics of wave formed erosional and depositional features, and fluvial strath terraces of Lake Owens between Olancha and Poverty Hills. Their shoreline features, dated at between ca 340-60 ka and ca 130 – 50 ka, are deformed about 20 $\pm$ 4 m across the Owens Valley fault zone. Elevations range from 3829 ft (1176 m) to 3878 ft (1182 m) on the lower flanks of the Inyo Mountains and Coso Range east of the fault zone to a high of 3950 ft (1204 m) west of the zone.

Local Geology

All proposed Olancha/Cartago Four-Lane project alternatives would be constructed in an area mapped as Quaternary alluvium (Qal) by Stinson (1977a, b) and Du Bray and Moore (1985) and as older alluvial fan deposits (Qoa) by Hollett and others (1991). The Quaternary sedimentary deposits that fill the valley and underlie the project area are predominantly from the Sierra Nevada (Hollett and others, 1991). These deposits are primarily a heterogeneous mixture of unconsolidated to moderately consolidated gravel, sand, silt, and clay. Changing depositional environments during the filling of the valley have created a complex arrangement of irregular overlapping and interfingering lenses and layers of fluvial, lacustrine, alluvial fan, littoral, deltaic, colluvial, and glacial deposits. Later reworking and redeposition of some parts of the valley fill by fluvial and beach processes has further complicated interpretation of the sedimentary sequences. Alluvial fan deposits interfinger with fluvial and lacustrine deposits.

Alluvial fans in Owens Valley are characterized by Hollett and others (1991) as older or younger. Older alluvial fans are dissected and entrenched by modern stream channels and overlain in part by younger alluvial fans. Entrenchment of tributary streams in older alluvial fans along the Sierra Nevada has resulted in the formation of younger alluvial fans and a shift in deposition away from the mountains. Younger alluvial fans are deposited over the margin of older fluvial and lacustrine deposits and older fan deposits.

Fluvial and lacustrine deposits of Owens valley consist of interbedded gravel, sand, silt, and clay. Beds commonly interfinger or are present as lenses within other beds. Few continuous beds or lenses of similar texture in the fluvial and lacustrine deposits can be reliably correlated over large distances. This lenticular form is repeated continuously across the valley and produces a characteristic interfingering and overlapping form in most areas. The layered sediment generally consists of alternating gravel, sand, silty-clay, and clay beds and lenses.

Byrd and Hale (2002) investigated the vertical depth of cultural deposits in the project area for a phase II prehistoric sites investigation. Shovel test pits were excavated on the toes of the alluvial fans east of the Los Angeles aqueduct to a maximum depth of 2½ ft (80 cm). Test pit excavation was terminated at a shallower depth if the upper levels produced no artifacts or cobble layers were encountered; occasionally, the depths of the pits exceeded 2½ ft. Most test pits were terminated at less than 2½ ft. The results of these test pits indicate that most prehistoric soil levels of interest to archaeology investigations (Holocene age) in the project area would be at less than 2½ ft in depth; however, Holocene sediments could exceed this depth.

Fossils

Quaternary alluvium is generally ranked as low sensitivity in the CSUF (2000a) database because of the low probability of encountering significant fossils in the upper few feet. However, fossil localities do occur in Quaternary strata in Inyo County. Fossils specimens recovered from localities near the Olancha/Cartago Four-Lane project area appear to be primarily from the fluvial and lacustrine deposits of Owens Valley.

Dundas (CSUF, 2000b) reports a UCMP vertebrate locality (Green Velvet 3, V67136) ¾ mile west of Olancha from which a specimen of *Equus* (horse) was recovered. The UCMP (2010) collections database of other nearby fossil localities includes Zurich 1 and 2 (UCMP 1764-1765) near Big Pine in lacustrine sediments.

The Los Angeles County Museum of Natural History (LACM) has three localities in the area from Quaternary sediments (Jefferson, 1991). Two localities at Haiwee Reservoir, LACM 3514 and 4538, produced specimens of *Mammuthus* sp. and a locality at Lone Pine Southeast (Owens Lake), LACM 4691, produced specimens of Felidae, Proboscidea, *Equus* sp. and Camelidae. A paleontology study for an Environmental Impact Report prepared for the Great Basin Unified Air Pollution Control District reported a number of fossils recovered from Owens Lake bed sediments (Gust and Scott, 2007). These fossils are apparently now at the Natural History Museum of Los Angeles County (LACM, 2008).

Additional nearby Quaternary vertebrate sites are reported by Jefferson (1991) in Inyo County including a San Bernardino County Museum locality at Owens Lake East, SBCM 6.6.3-6.6.4, that produced specimens of *Equus* sp., *Camelops* sp. and *Bison* sp.

ENVIRONMENTAL CONSEQUENCES

Construction Related Impacts

The Quaternary sediments in the Olancha/Cartago Four-Lane project area consist of alluvial fan deposits that interfinger with fluvial and lacustrine deposits. The project build areas are within the Pleistocene Lake Owens shoreline and construction excavation would likely encounter fluvial and lacustrine deposits. The fluvial and lacustrine deposits of Owens Valley, including the Lake Owens lake bed deposits, are known to contain fossils scientific interest. Excavation in the Olancha/Cartago Four-Lane project area could encounter these fluvial and lacustrine deposits and scientifically significant vertebrate fossils. Because the upper few feet of these deposits may be weathered or disturbed, paleontological monitoring and salvage would likely be recommended on the project where excavation would disturb in situ sedimentary strata below the upper soil layers (i.e. upper few feet).

Alternatives 1, 2, 2A, and 3 would be constructed on Quaternary sediments east of the Los Angeles Aqueduct. Construction would be on relatively flat ground between about 3600 feet and 3800 feet above sea level. Roadway excavation for these alternatives is expected to be between 235,000 and 353,000 cubic yards (Caltrans, 2008b, attach. B). The depth of excavation for the structural section is not known at this time. Alternative 4 is higher up on the alluvial fans between about 3600 feet and 4000 feet above sea level west of the Los Angeles Aqueduct. Roadcuts for Alternative 4 may be as much as 30 feet deep in places (Chegwidden, 2009). Roadway excavation for Alternative 4 of 618,000 yards would be about twice that required for the other alternatives under consideration (Caltrans, 2008b, attach. B, p. 19).

<u>All Build Alternatives</u>

All build alternatives would require imported fill that would be supplied from a borrow site within the project limits. Two material sites, MS 290 and MS165, within Alternative 4 are under consideration to supply the borrow (Caltrans, 2008b, p. 14). MS 290 would provide approximately 164 acres to be mined, and MS 165 would provide approximately 80 acres. Excavation depth for the borrow sites might be as much as 10 feet deep. Site MS-290 is located west of the town of Olancha at the western terminus of Fall Road (Caltrans, 2008a). The eastern boundary of the site approximately parallels the L.A. Aqueduct. Site MS-165 is located approximately 2 miles north of the town of Cartago along U.S. Highway 395. It is situated between 395 and the L.A. Aqueduct.

<u>No Build</u>

The No Build Alternative proposes to leave the facility as it currently exists and would have no impact on paleontological resources.

Although construction excavation for this project might have an adverse impact on paleontological resources, properly implemented mitigation during construction would reduce this impact to a less than significant level. The potential impact to paleontological resources would be less than significant and the project as a whole would have no significant impact to those resources.

Cumulative Impacts

Cumulative impacts considers whether the action is related to other actions with individually insignificant but cumulatively significant impacts (40 CFR Part 1508.27). Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

Caltrans constructs highways in many locations throughout the state that require excavation in fossiliferous sediments similar to those found in the Olancha/Cartago Four-Lane project area. While individually many of these construction projects involve smaller amounts of excavation resulting in a lower intensity of impact, the total extent of all excavation for these projects could result in the loss of a large number of important fossils. The loss of even a few scientifically significant fossil specimens would mean the inability to piece together important parts of the earth's history and the evolution of species.

Although construction excavation for this project might have an adverse cumulative impact on paleontological resources, properly implemented mitigation during construction would reduce this impact to a less than significant level. The potential cumulative impact to paleontological resources would be less than significant and the project as a whole would have no significant cumulative impact to those resources.

Land Ownership/Permits Required

If paleontological specimens are collected from private property, written permission is required from the landowner. In the instance of mitigation during the construction phase of a state transportation project, Caltrans typically is the fee-simple landowner. In the case of easements across federally administered lands, the Federal land-managing agency generally retains ownership of the paleontological specimens and permits may be required from the agency.

Bureau of Land Management (BLM) property underlies portions of all project alternatives and a permit will be required for paleontology mitigation activities. The Los Angeles Department of Water & Power and the State Lands Commission also own land in the project area (Caltrans, 2008b), and permits or written permission may be required if this land will not be purchased by Caltrans. Alternative 4 may also impact US Forest Service land and a permit from the US Forest Service would be required.

FURTHER STUDIES

Paleontological Evaluation Report

A Paleontological Evaluation Report is required to assess the impact to paleontological resources and determine the significance of any impact. Construction excavation for Olancha/Cartago Four-Lane project would require excavation for the roadway structural section, and various structures. All build alternatives would require fill that would be supplied by excavation from a borrow site within the project limits. Major, deep construction excavation for this project appears likely to impact the Quaternary fluvial and lacustrine sediments known to contain fossils of scientific interest. The extent to which scientifically important fossils will actually be encountered during construction excavation cannot be determined until excavation begins and the sensitive strata are exposed. The assessment of any potential impact to fossil resources is best accomplished through an understanding of the geologic framework of the project area and defining paleontological resources as the fossil bearing geologic formations.

If a paleontological resource cannot be avoided, then it is necessary to determine its significance or scientific importance before any mitigation measures are proposed. This may be stated for a particular fossil species, fossil assemblage, or for a rock unit as a whole. Under Caltrans guidelines published online in the Caltrans Standard Environmental Reference (Caltrans, 2009), rock units which, based on previous studies, contain or are likely to contain significant vertebrate, significant invertebrate, or significant plant fossils are classified as High Potential. Areas with a high potential for containing significant paleontological resources require monitoring and mitigation.

Significance assessments should necessarily be based on the recommendations of a professional Principal Paleontologist with expertise in the region under study and the resources found in that region. If a paleontological resource assessment results in a determination that the site is insignificant or of low sensitivity, this conclusion should be documented in a Paleontological Evaluation Report and in the project's environmental document in order to demonstrate compliance with applicable statutory requirements. If a paleontological resource is determined to be significant, of high sensitivity, or of scientific importance, and the project impacts it, a mitigation program must be developed and implemented.

Construction excavation for Olancha/Cartago Four-Lane project has the potential for an adverse impact to paleontological resources without proper mitigation. Any adverse impact to paleontological resources could be minimized by implementing a well-designed paleontological resource mitigation plan. Proper paleontological monitoring and mitigation could actually result in beneficial effects on paleontological resources through the discovery of fossils that would not have been exposed without construction and, therefore, would not have been available for study. The implementation of a well-designed paleontological resource mitigation plan following Caltrans guidelines (Caltrans, 2009) to salvage fossil specimens during construction excavation for this project would result in the reduction of any adverse impact to a less than significant level.

Paleontological Mitigation Plan
If mitigation will be required, a preliminary Paleontological Mitigation Plan (PMP) should be prepared concurrent with preparation of the project's environmental document/determination so that responsible agency and stakeholder concerns can be incorporated into the plan. A final plan should be prepared by or under the supervision of a qualified Principal Paleontologist in advance of an anticipated start work date in time for the plan to meet all necessary approvals. The PMP will serve as the basis for obtaining necessary permits from other agencies. The required format for the PMP is detailed in the Caltrans SER (Caltrans, 2009).

Paleontological Mitigation Report
Plan implementation must be completed under the direction of a qualified Principal Paleontologist. A final Paleontological Mitigation Report documenting implementation of the approved PMP must be prepared by, or under the direction of, the Principal Paleontologist. The required sections of the PMR are listed in the Caltrans SER (Caltrans, 2009).

Paleontological Stewardship Summary
After the completion of paleontological mitigation, environmental staff should supply to both Maintenance and Operations staff (including the Encroachment Permits Office) a list of any long term commitments. An updated Environmental Commitments Record and/or Certificate of Environmental Compliance may generally serve this purpose.

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APPENDIX I

Highway 395 Initial Assessment Report on Paleontological Sensitivity. Letter report from Dr. Robert Dundas, Vertebrate Paleontologist, California State University, Fresno.

CALIFORNIA
STATE
UNIVERSITY,
FRESNO

May 25, 2000

Juan Torres
Environmental Services
State of California
Department of Transportation
3402 N. Blackstone Suite 201
Fresno, CA 93726

Dear Mr. Torres,

Highway 395 Initial Assessment Report on Paleontological Sensitivity

I. Project description

California State University, Fresno has completed an initial paleontological assessment of the Highway 395 Olancha / Cartago 4-lane project area beginning at post-mile 30.8 and ending with post-mile 41.3 in Inyo County. The objectives of the assessment were to identify specific fossil localities and sensitive geologic formations within a one mile corridor along the proposed project route (as per interagency agreement 06A0281, MOU #11). Caltrans is proposing to upgrade the existing two-lane conventional highway to a four-lane expressway, or partial conventional four-lane highway along this segment of Highway 395. This paleontological assessment was conducted to assist Caltrans with compliance responsibilities under CEQA and NEPA.

II. Findings

We reviewed pertinent geologic maps and conducted a literature search to identify stratigraphic units occurring in the project area; see Appendix A for the list of references. The stratigraphic units within one mile of Highway 395 along the project area range in age from Mesozoic - late Cenozoic. Mesozoic granitic and metamorphic rocks occur in the western zone of the one mile corridor along the north portion of the project area (pm ~37.3-41.3). These igneous and metamorphic units do not contain fossils and are also not likely to be disturbed during project construction. Because the igneous and metamorphic rocks are not sensitive, they are not discussed further here. Low sensitivity Quaternary alluvium underlies Highway 395 throughout the project area and a previously recorded vertebrate site in the alluvium triggered this assessment.

A record search for fossil sites within the project area was conducted at the University of California Museum of Paleontology at Berkeley (UCMP). One vertebrate fossil locality has been previously recorded within the project area. UCMP locality number V67136, named the Green Velvet 3 site, occurs at 36°17'00"N latitude, 118°1'20"W longitude (±5"). The Green Velvet 3 site records a Pleistocene specimen of Equus (horse) consisting of the proximal end of a metacarpal III. The specimen was collected in 1959 by Olive Cantlay and donated to the UCMP. No other material is known to have been recovered. During the field examination of the project area, no new vertebrate sites were discovered.

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After reviewing the geologic maps, consulting the fossil repositories, and conducting a field examination, areas of low and high sensitivity for discovering significant fossil resources were plotted on the USGS 7.5" topographic maps covering the project area. Other than a one mile buffer zone of high sensitivity around the pre-existing fossil locality, the remainder of the project area is classified low sensitivity for discovering significant fossil resources.

III. Recommendations

The entire project is underlain by low sensitivity Quaternary alluvium that has produced vertebrate fossils elsewhere in the region (Jefferson, 1991), in addition to the one locality within the project area. There is always some potential for uncovering further specimens in the Quaternary alluvium. However, because the potential for uncovering scientifically significant vertebrate remains during excavation phases of the project is low, we do not recommend monitoring unless significant excavation is undertaken. Based on the currently proposed project alternatives, it appears little excavation will be required and so paleontological monitoring is not warranted during construction.

Sincerely,

Robert G Dundas

Robert G. Dundas, Ph.D.
Vertebrate Paleontologist

APPENDIX A

LITERATURE REFERENCES

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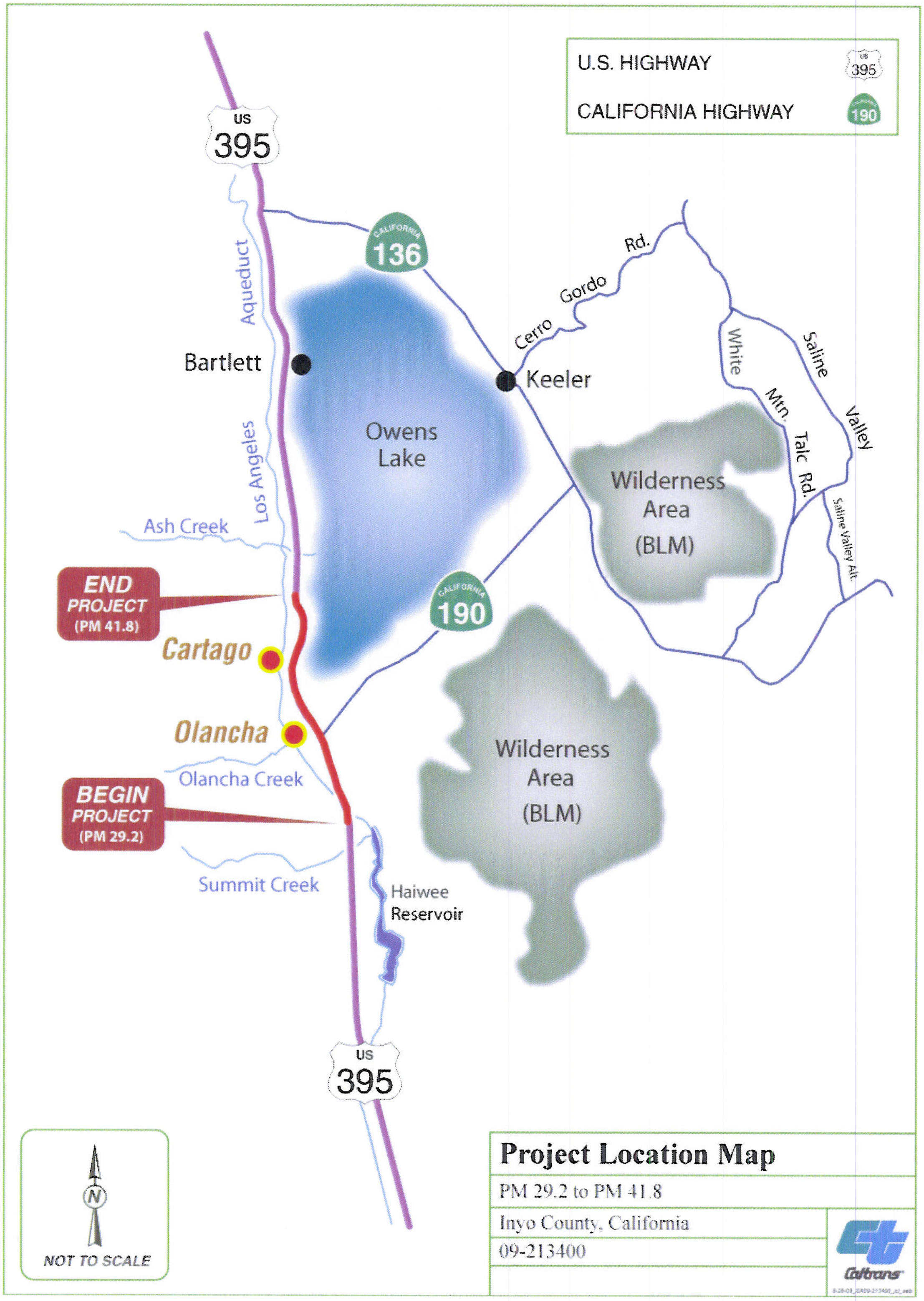
APPENDIX II Maps and Illustrations

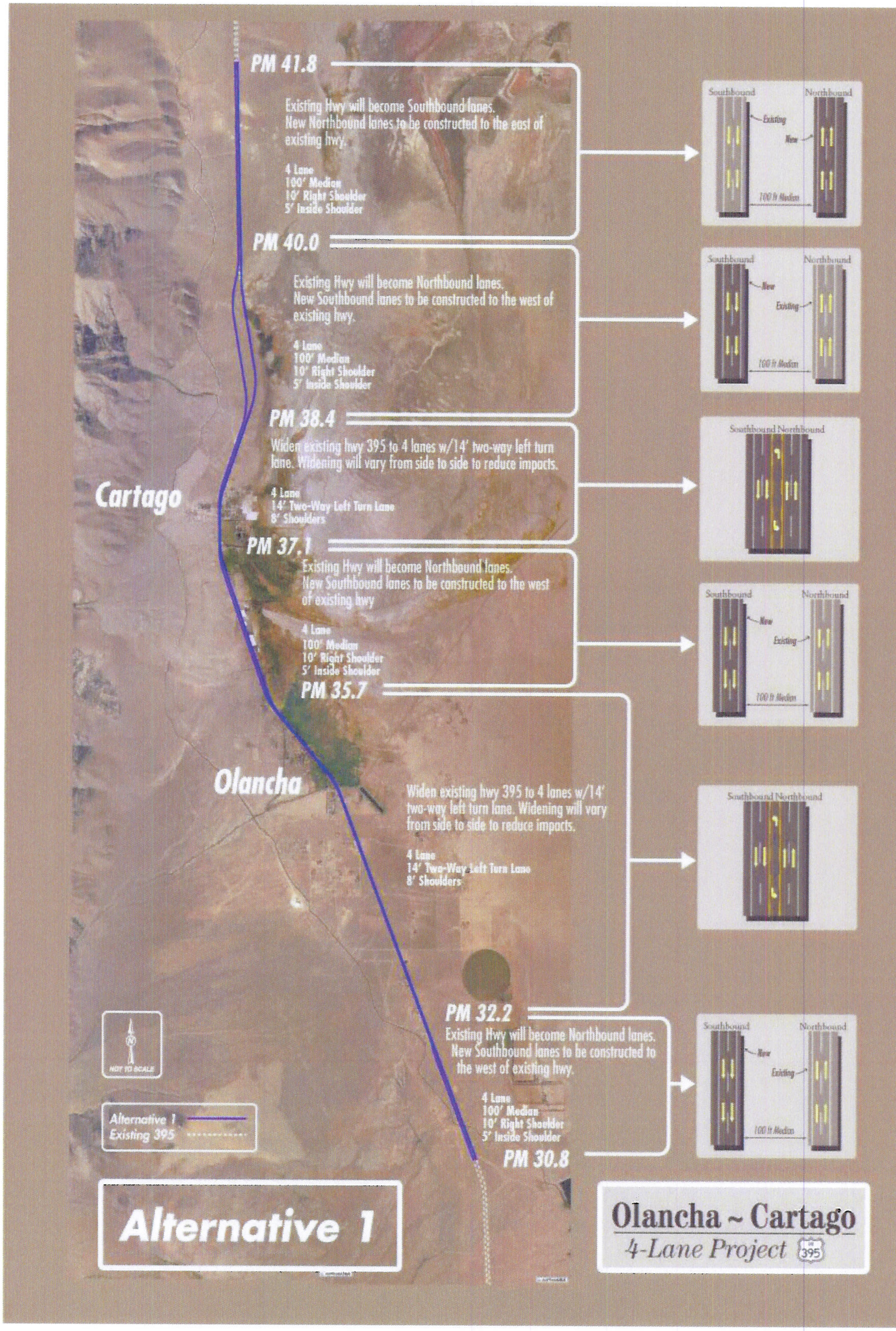
Project Vicinity Map

Project Vicinity Map
PM 29.2 to PM 41.8
Inyo County, California
09-213400

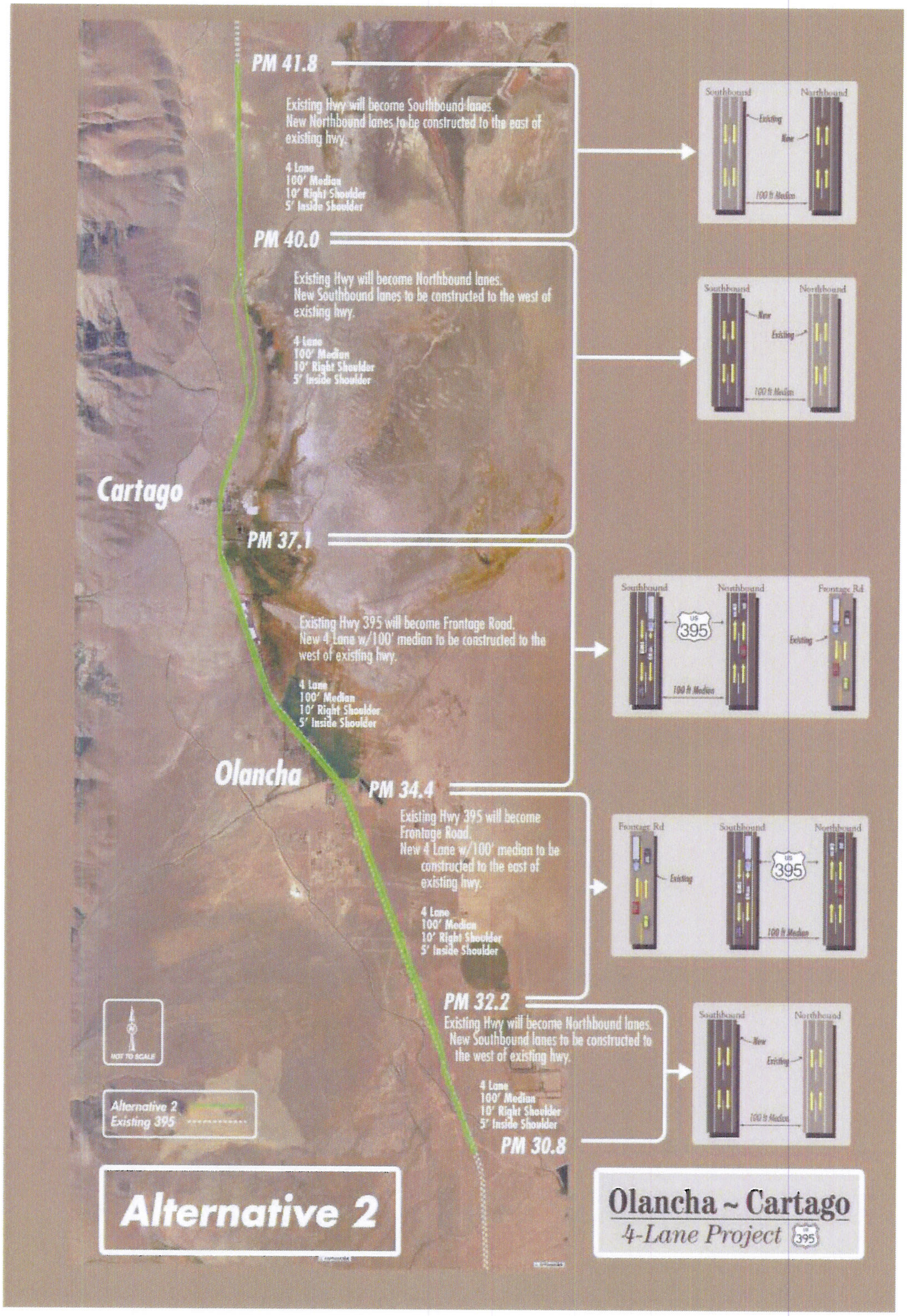
Caltrans

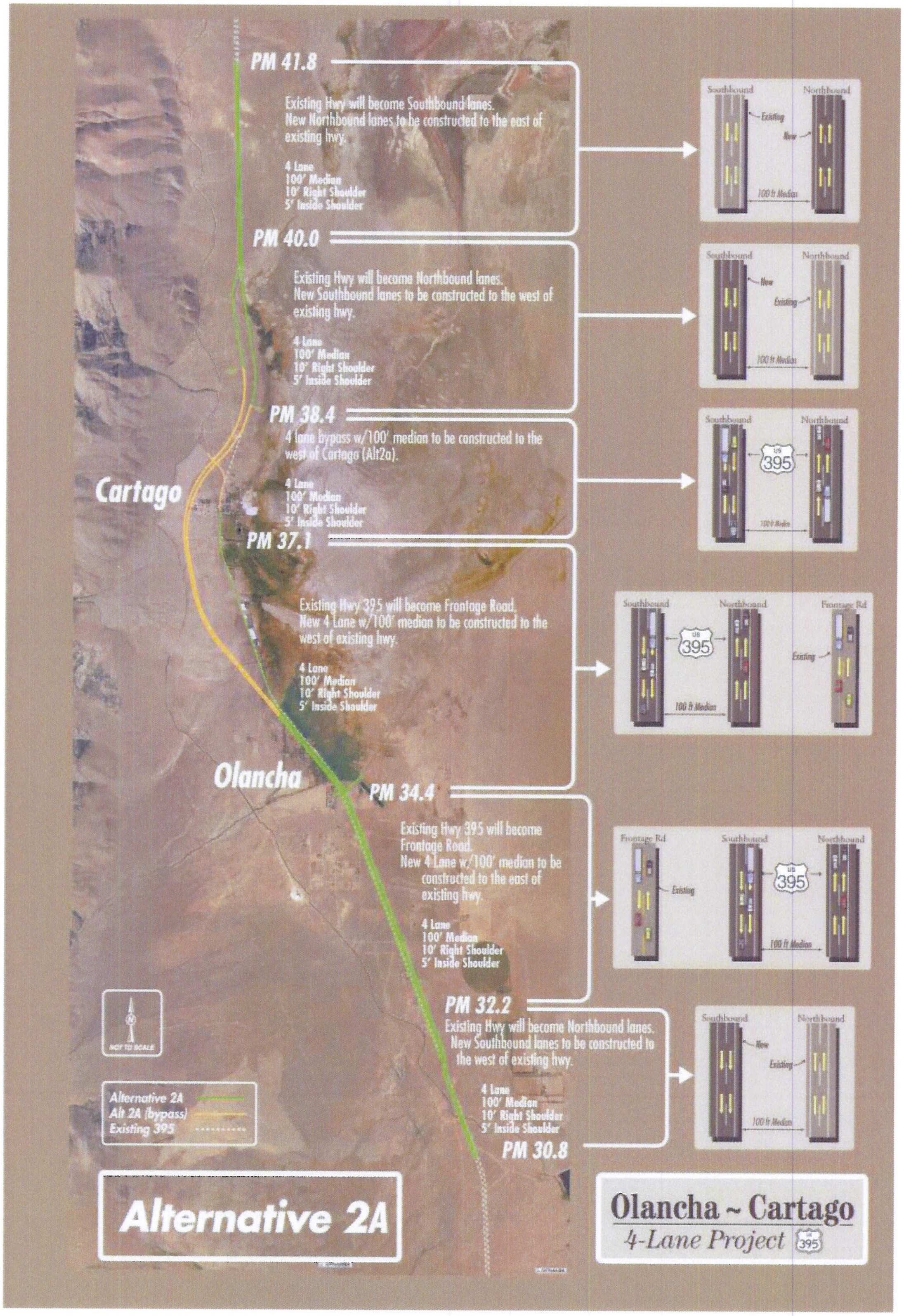


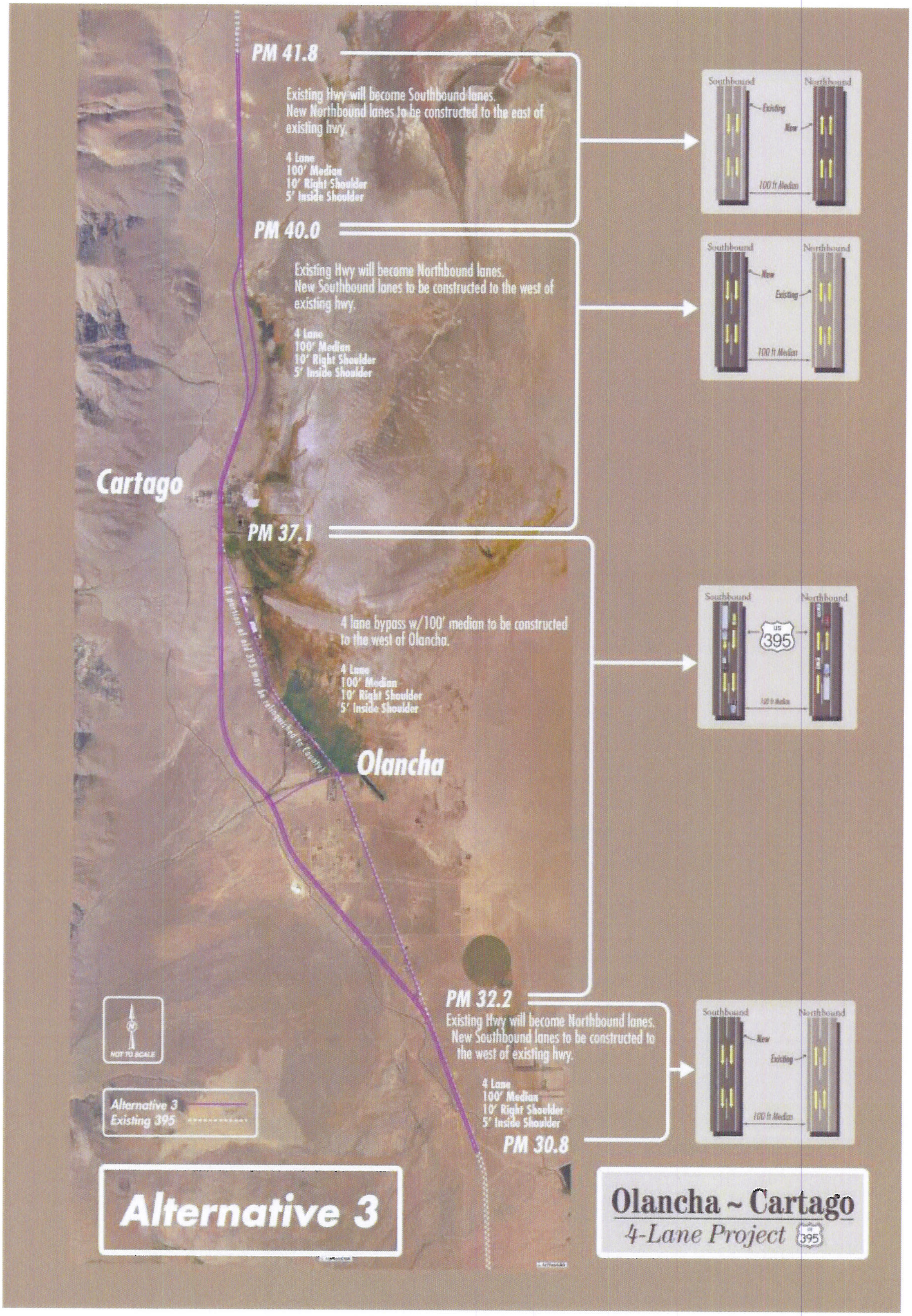
U.S. HIGHWAY
CALIFORNIA HIGHWAY
US 395
136
190
Aqueduct
Los Angeles
Bartlett
Owens Lake
Keeler
Cerro Gordo Rd.
White Mtn. Talc Rd.
Saline Valley
Saline Valley Alt.
Wilderness Area (BLM)
Ash Creek
END PROJECT (PM 41.8)
Cartago
Olancha
Olancha Creek
BEGIN PROJECT (PM 29.2)
Summit Creek
Haiwee Reservoir
Wilderness Area (BLM)
US 395
N
NOT TO SCALE
Project Location Map
PM 29.2 to PM 41.8
Inyo County, California
09-213400
Caltrans

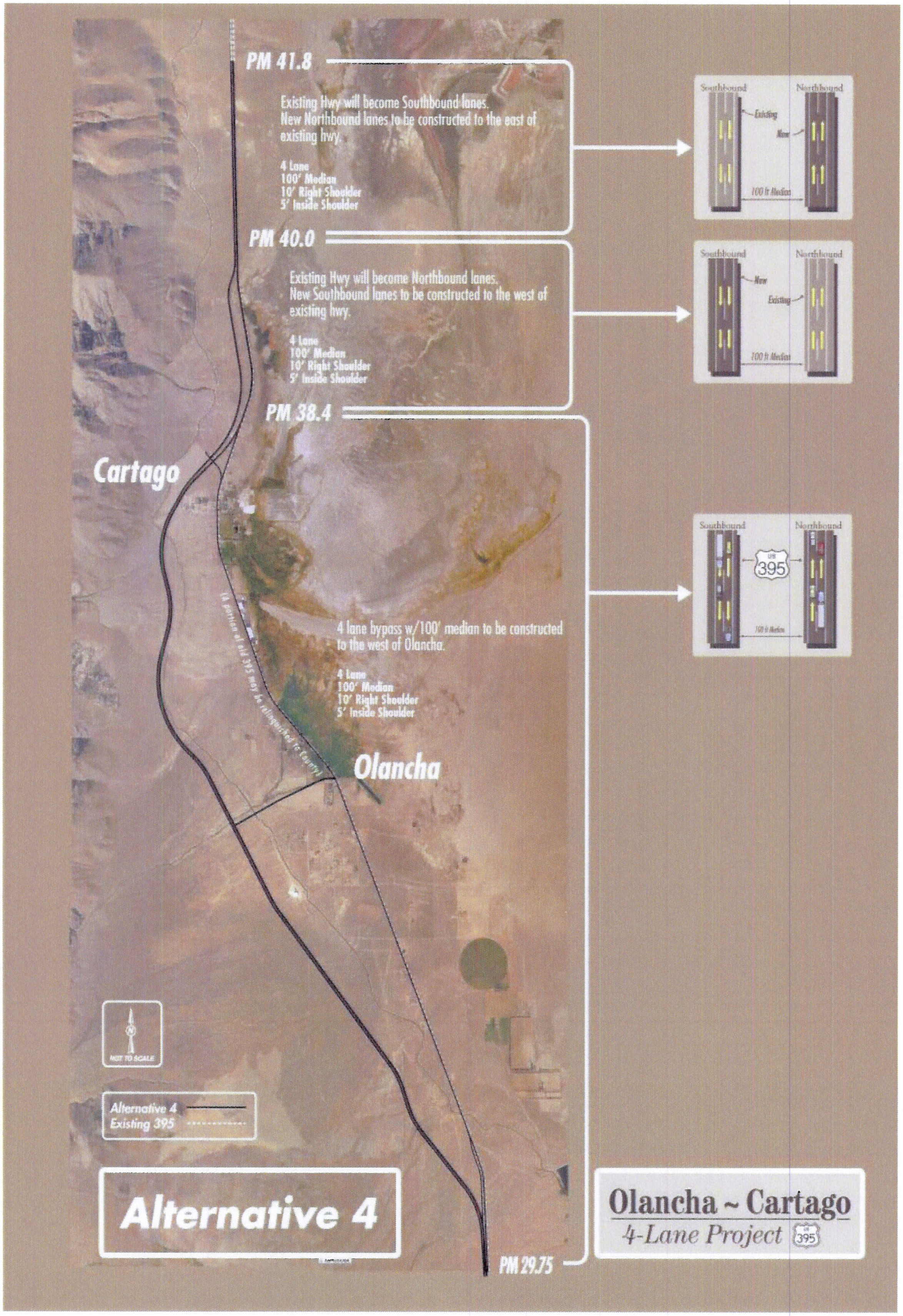


PM 41.8
Existing Hwy will become Southbound lanes.
New Northbound lanes to be constructed to the east of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
Existing
New
100 ft Median
PM 40.0
Existing Hwy will become Northbound lanes.
New Southbound lanes to be constructed to the west of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
New
Existing
100 ft Median
PM 38.4
Widen existing hwy 395 to 4 lanes w/14' two-way left turn lane. Widening will vary from side to side to reduce impacts.
Cartago
4 Lane
14' Two-Way Left Turn Lane
8' Shoulders
Southbound Northbound
PM 37.1
Existing Hwy will become Northbound lanes.
New Southbound lanes to be constructed to the west of existing hwy
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
New
Existing
100 ft Median
PM 35.7
Olancha
Widen existing hwy 395 to 4 lanes w/14' two-way left turn lane. Widening will vary from side to side to reduce impacts.
4 Lane
14' Two-Way Left Turn Lane
8' Shoulders
Southbound Northbound
PM 32.2
Existing Hwy will become Northbound lanes.
New Southbound lanes to be constructed to the west of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
New
Existing
100 ft Median
PM 30.8
N
NOT TO SCALE
Alternative 1
Existing 395
Alternative 1
Olancha ~ Cartago
4-Lane Project
395

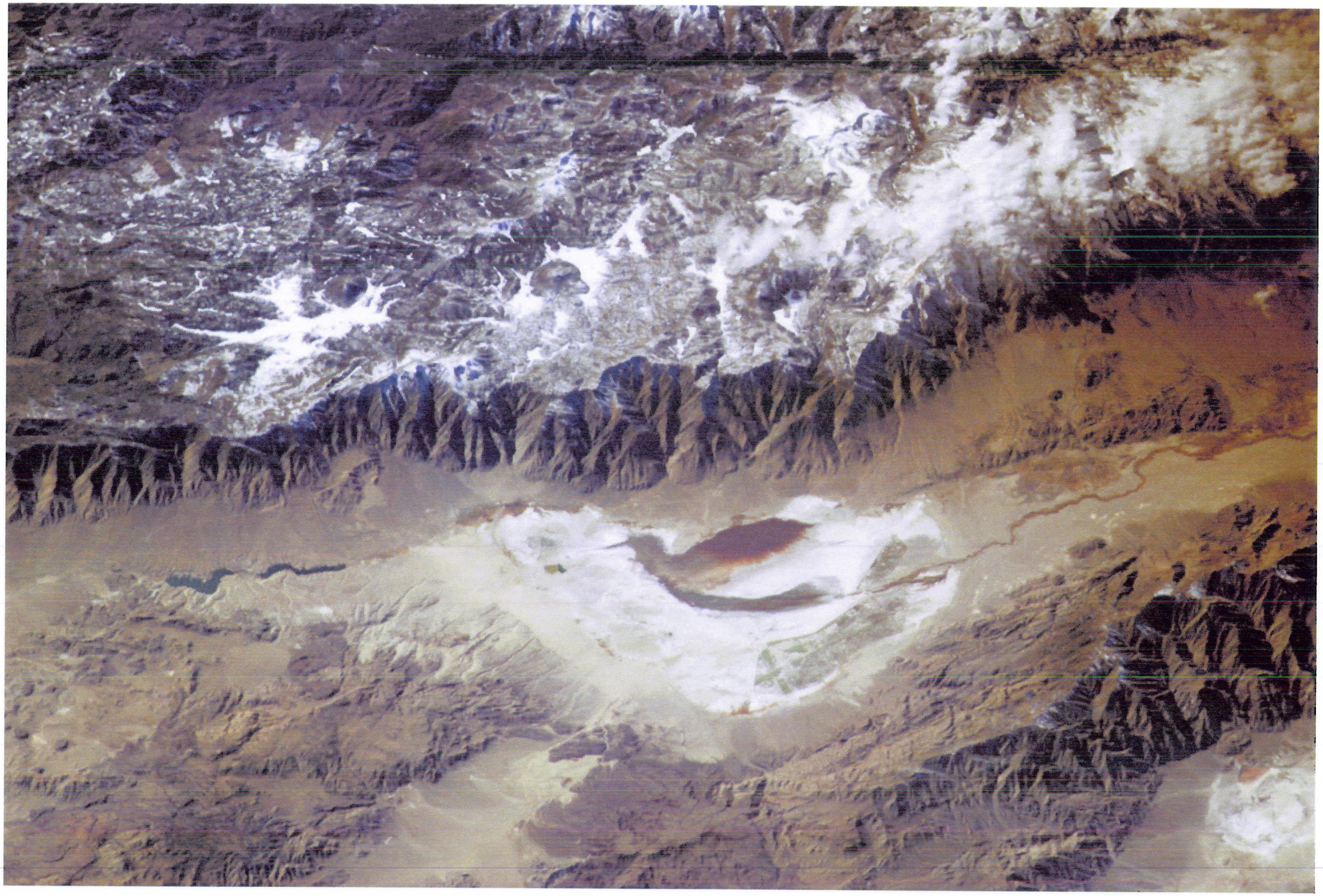

PM 41.8
Existing Hwy will become Southbound lanes.
New Northbound lanes to be constructed to the east of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
Existing
New
100 ft Median
PM 40.0
Existing Hwy will become Northbound lanes.
New Southbound lanes to be constructed to the west of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
New
Existing
100 ft Median
Cartago
PM 37.1
Existing Hwy 395 will become Frontage Road.
New 4 Lane w/100' median to be constructed to the west of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
Frontage Rd
395
Existing
100 ft Median
Olancha
PM 34.4
Existing Hwy 395 will become Frontage Road.
New 4 Lane w/100' median to be constructed to the east of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Frontage Rd
Southbound
Northbound
Existing
395
100 ft Median
PM 32.2
Existing Hwy will become Northbound lanes.
New Southbound lanes to be constructed to the west of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
New
Existing
100 ft Median
PM 30.8
NOT TO SCALE
Alternative 2
Existing 395
Alternative 2
Olancha ~ Cartago
4-Lane Project
395


PM 41.8
Existing Hwy will become Southbound lanes.
New Northbound lanes to be constructed to the east of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
Existing
New
100 ft Median
PM 40.0
Existing Hwy will become Northbound lanes.
New Southbound lanes to be constructed to the west of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
New
Existing
100 ft Median
PM 38.4
4 lane bypass w/100' median to be constructed to the west of Cartago (Alt2a).
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
395
Cartago
PM 37.1
Existing Hwy 395 will become Frontage Road.
New 4 Lane w/100' median to be constructed to the west of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
Frontage Rd
395
Existing
100 ft Median
Olancha
PM 34.4
Existing Hwy 395 will become Frontage Road.
New 4 Lane w/100' median to be constructed to the east of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Frontage Rd
Southbound
Northbound
Existing
395
100 ft Median
PM 32.2
Existing Hwy will become Northbound lanes.
New Southbound lanes to be constructed to the west of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
New
Existing
100 ft Median
PM 30.8
N
NOT TO SCALE
Alternative 2A
Alt 2A (bypass)
Existing 395
Alternative 2A
Olancha ~ Cartago
4-Lane Project
395


PM 41.8
Existing Hwy will become Southbound lanes.
New Northbound lanes to be constructed to the east of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
Existing
New
100 ft Median
PM 40.0
Existing Hwy will become Northbound lanes.
New Southbound lanes to be constructed to the west of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
New
Existing
100 ft Median
Cartago
PM 37.1
(A portion of old 395 may be relinquished to County)
4 lane bypass w/100' median to be constructed to the west of Olancha.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
US 395
Olancha
PM 32.2
Existing Hwy will become Northbound lanes.
New Southbound lanes to be constructed to the west of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
New
Existing
100 ft Median
PM 30.8
NOT TO SCALE
Alternative 3
Existing 395
Alternative 3
Olancha ~ Cartago
4-Lane Project
395



PM 41.8
Existing Hwy will become Southbound lanes.
New Northbound lanes to be constructed to the east of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
Existing
New
100 ft Median
PM 40.0
Existing Hwy will become Northbound lanes.
New Southbound lanes to be constructed to the west of existing hwy.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
Southbound
Northbound
New
Existing
100 ft Median
PM 38.4
Cartago
Southbound
Northbound
395
4 lane bypass w/100' median to be constructed to the west of Olancha.
4 Lane
100' Median
10' Right Shoulder
5' Inside Shoulder
(A portion of old 395 may be relinquished to County)
Olancha
NOT TO SCALE
Alternative 4
Existing 395
Alternative 4
PM 29.75
Olancha ~ Cartago
4-Lane Project
395

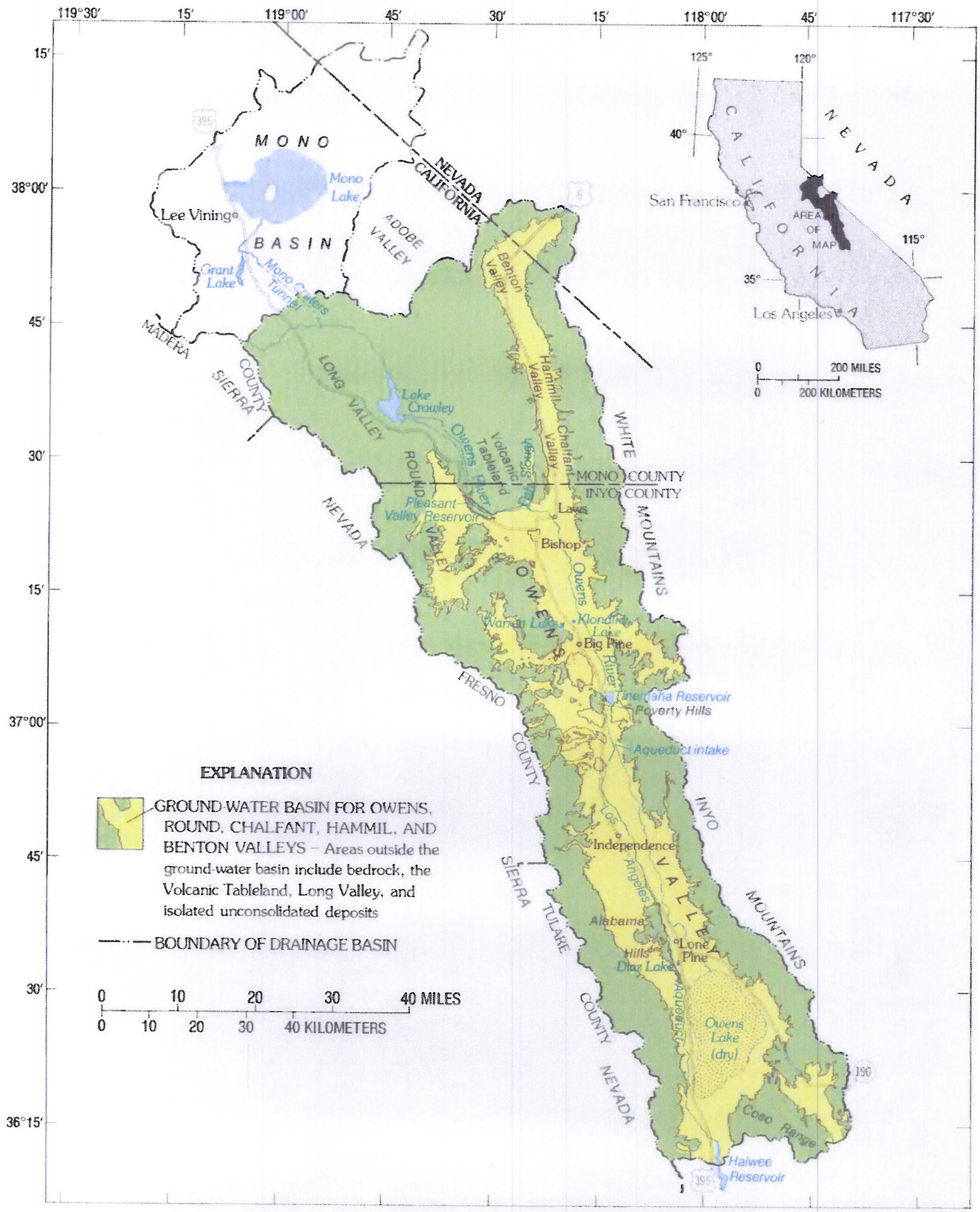


Southern Sierra Nevada and Owens Lake (NASA, 2010) View west across Owens Valley from International Space Station showing steep eastern scarp of the Sierra Nevada. Inyo Mountains in lower right (north) and Coso Range in lower left. Owens Lake is in the center of the photo with North and South Haiwee Reservoirs to the south and Alabama Hills to the north in the valley.

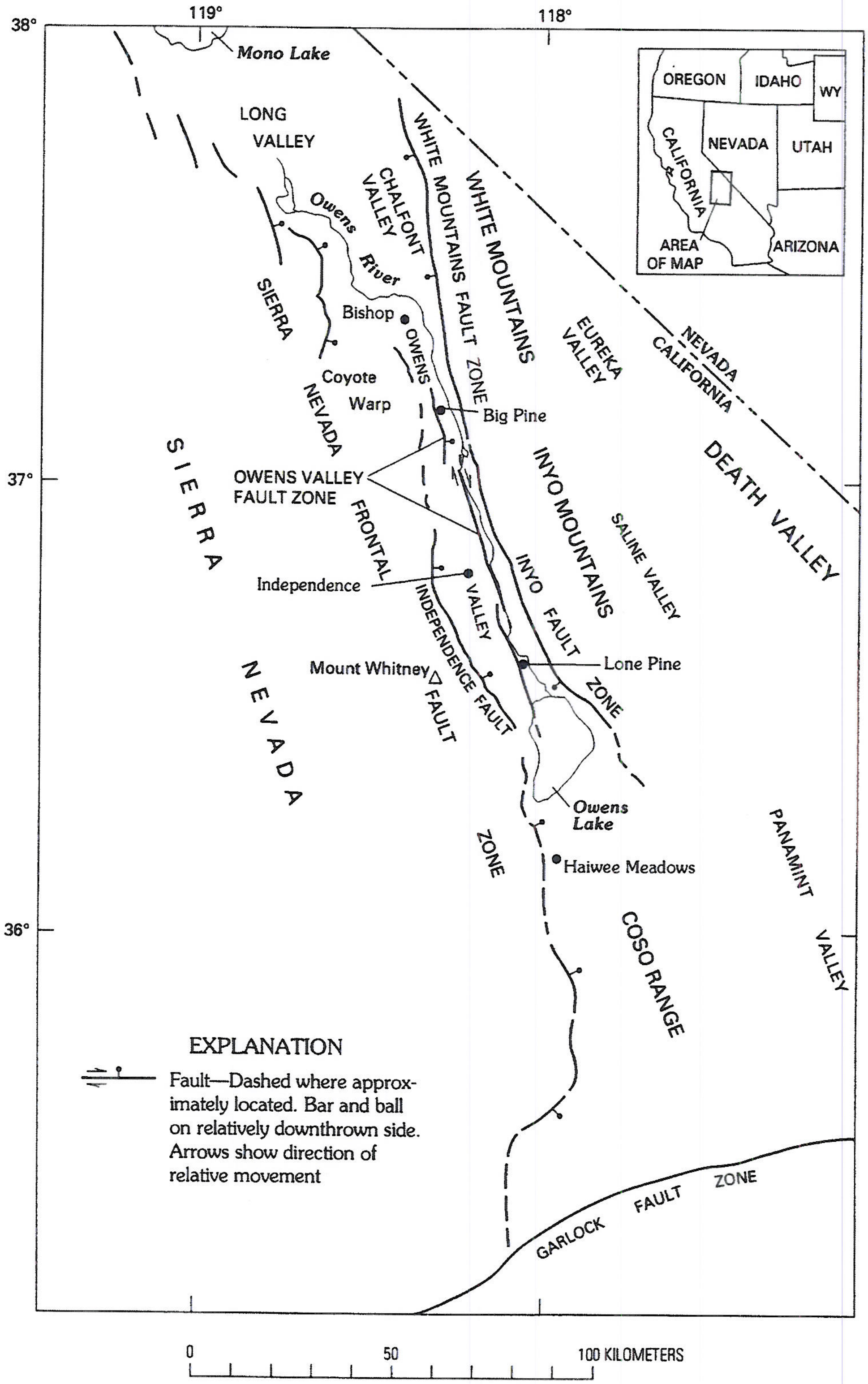
GEOLOGIC TIME SCALE

RELATIVE GEOLOGIC TIME				TIME In Millions of Years Before Present
Era	**Period**		**Epoc**	
CENOZOIC	Quaternary		Holocene	0.011
			Pleistocene	1.6
	Tertiary		Pliocene	5.3
			Miocene	24
			Oligocene	37
			Eocene	58
			Paleocene	65
MESOZOIC	Cretaceous			144
	Jurassic			208
	Triassic			245
PALEOZOIC	Permian			286
	Carbon-iferous	Pennsylvanian		320
		Mississippian		360
	Devonian			408
	Silurian			438
	Ordovician			505
	Cambrian			570
PRECAMBRIAN				

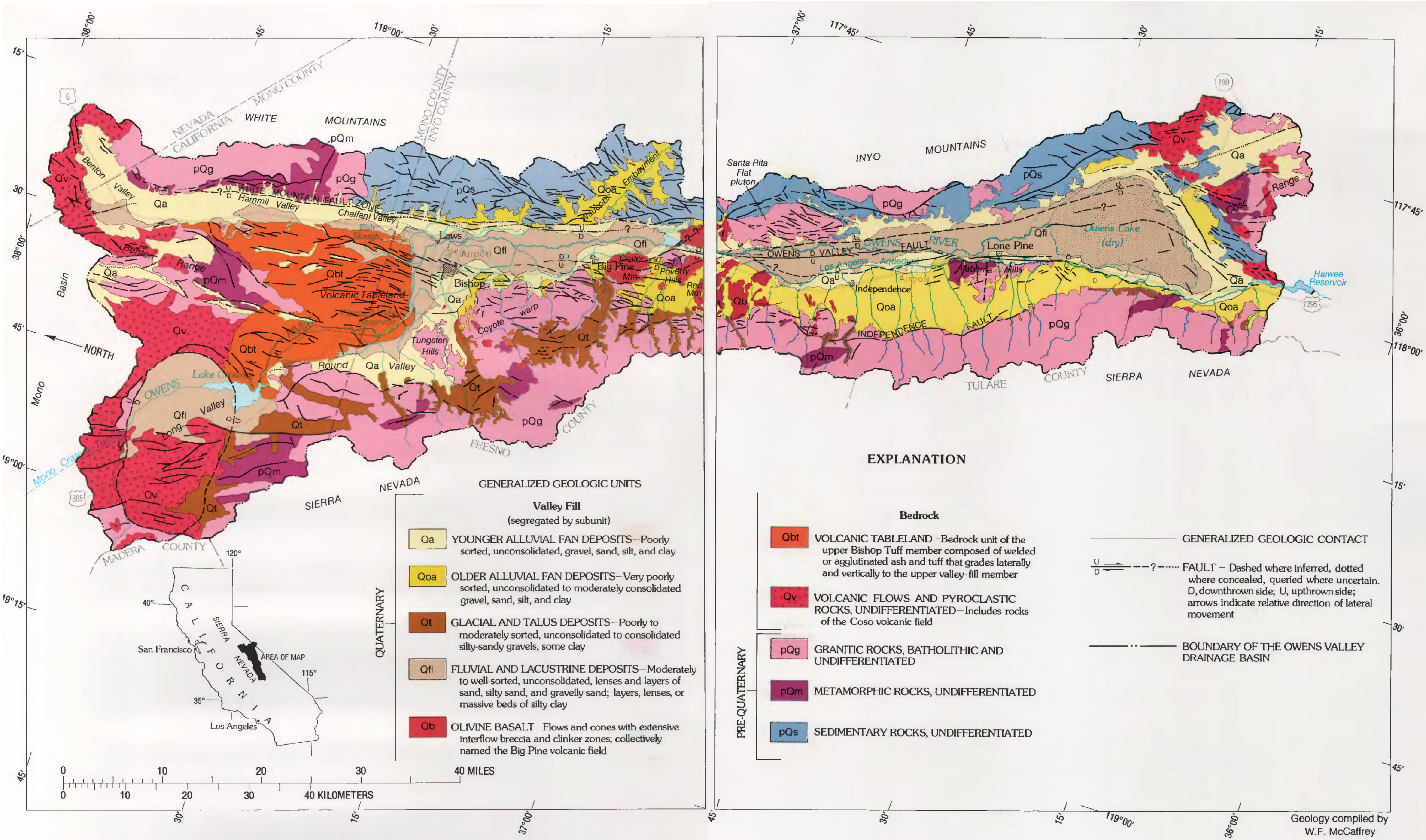
Modified from California Geological Survey Note 17



Location of Owens Valley and Mono Basin drainage areas and physiographic and cultural features (from Hollett and others, 1991, fig. 1).



Location of Owens Valley fault zone, California (from Beanland, Sarah, and Clark, M.M., 1994) Owens Valley is bounded on the west by frontal faults at the base of the Sierra Nevada and on the east by frontal faults at the base of theInyo and White Mountains.



Generalized geologic map of the Owens Valley drainage basin (from Hollet and others, 1991, fig. 7)

PALEONTOLOGICAL EVALUATION REPORT FOR THE OLANCHA/CARTAGO 4-LANE INYO COUNTY, CALIFORNIA

SR 395: PM 29.2 to 41.8 in Inyo County;
EA 09-213404; District 09-0000-0030-4

April 2014

Submitted to:

Caltrans

Juergen Vespermann
Central Region Hazardous Waste and Paleontology Branch
California Department of Transportation, 855 M Street, Suite 200, Fresno, CA 93721

Prepared by:
Sherri Gust and Kim Scott, Cogstone Resource Management Inc.
1518 W. Taft Ave., Orange, CA 92865 714-974-8300 www.cogstone.com

Sherri Gust, Qualified Principal Paleontologist — Date: April 26, 2014

Jay Schneider, California Professional Geologist #8787 — Date: April 26, 2014

Under Contract To:
Parsons Transportation Group, Inc., 100 West Walnut Street, Pasadena, California 91124

For individuals with sensory disabilities this document is available in alternate formats. Please call or write to Juergen Vespermann, 855 M Street, Suite 200, Fresno, CA 93721. 559-445-6369 Voice, or use the CA Relay Service TTY number 1-800-735-2929.

Cogstone Project Number: 2398-003
Type of Study: Paleontological Evaluation Report
BLM Permit: CA-13-05P
Localities: Ten newly discovered during survey
USGS Quadrangles: Haiwee Reservoir 7.5', Haiwee Pass 7.5', Vermillion Canyon 7.5', Olancha 7.5' & Bartlett 7.5'
Area: 12.6 linear miles
Key Words: Coso Formation, Quaternary older alluvial fans, Quaternary older alluvium, Quaternary alluvium, Quaternary alluvial fans, Quaternary lake deposits, PYFC 2 to 3a, newly discovered fossils

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LIST OF ACRONYMS and ABBREVIATIONS

BLM – Bureau of Land Management
Caltrans - California Department of Transportation
CEQA – California Environmental Quality Act
CFR - Code of Federal Regulations
FHWA – Federal Highway Administration
M.S. – Master's of Science
NEPA – National Environmental Policy Act
PEAR - Preliminary Environmental Analysis Report
PER – Paleontological Evaluations Report
PES - Preliminary Environmental Study
PFYC – Potential Fossil Yield Classification
PL – Public Law
PM – Post Mile
PRC - Public Resources Code
PSA – Project Study Area
SBCM – San Bernardino County Museum
SR-**395** – State Route 395
UCMP – University of California Museum of Paleontology
USC – Unites States Code
USGS – United States Geological Survey

EXECUTIVE SUMMARY

The purpose of this document is to assess the potential for impacting fossil resources along State Route 395 during proposed work to enlarge the highway to 4-lanes for the Olancha/Cartago Four-Lane Project in central-western Inyo County, California. At the southern end the modifications begin near Summit Creek (Post Mile (PM) 29.9) and extend north to near Ash Creek Bridge (PM 41.8). Proposed modifications to the route include: upgrade the 2-lane highway to a 4-lane highway with 12 foot lanes; construct right and left turn lanes and acceleration/deceleration lanes; update road connections to current Caltrans standards including paved shoulders; and improve drainages with box culverts and pipe culverts; build a new bridge crossing the Los Angeles Aqueduct.

The Project Study Area (PSA) includes approximately 12.6 linear miles of new alignment for SR-395, mostly west of the existing highway. Cut depths are estimated at a maximum of 75 feet for the road alignment. The proposed borrow site will be mined to a depth of approximately ten feet. Geologic mapping indicates that the surficial deposits of the entire alignment consist of Quaternary alluvium and Quaternary alluvial fans. Subsurface Quaternary older alluvium and, at the southern end of the project, the Pliocene Coso Formation may be encountered. Record searches revealed no fossils within the PSA. Fossils are known within a mile from the Pleistocene Quaternary older alluvium east of Kaiwee Reservior and the Pliocene Coso Formation.

Paleontological sensitivity analysis determined that the Quaternary alluvium, Quaternary older alluvium, and Coso Formation are ranked moderately sensitive and have potential to produce significant vertebrate fossils. The Quaternary alluvial fans and Quaternary older alluvial fans are assigned a low sensitivity due to their coarse-grained nature.

A field survey to assess the sediments and potential impacts was conducted on September 18 and 19, 2013 by Kim Scott and Courtney Richards. The survey consisted of a windshield survey of the PSA followed by a pedestrian survey of those sediments determined conducive to fossil preservation as they were encountered. Sediments were assigned to formations based on pre-existing geological mapping and observations of sediment color, consistency and depositional environment recorded. Ground visibility was good to excellent along the PSA. The majority of the PSA consists of Holocene proximal alluvial fan and debris flow deposits off the Sierra Nevada Mountains located west of the PSA. To the east of the PSA, lacustrine deposits of Owens Lake interfinger with these coarse deposits. Within the northern portion of the PSA, fine grained lacustrine deposits of Owens Lake are exposed where uplifted along a fault. Ten fossil localities were discovered and recorded on the surface in this area.

The survey found fossils exposed on the surface and several areas with fine-grained sediments at the surface (Sta. 570-420, 390-375, 275-240, 120-80 and 70-52) as documented on the sensitivity maps. However, additional fine-grained sediments may be revealed by project excavations. Due to Pleistocene fossils located on the surface of the PSA during the survey and additional fossils anticipated to be revealed by project earthmoving, a Paleontological Mitigation Plan is recommended.

INTRODUCTION

PURPOSE OF DOCUMENT

The purpose of this document is to assess the potential for impacting fossil resources along State Route 395 (SR-395) during proposed work to enlarge the highway for the Olancha/Cartago 4-Lane Project. Specifically the Project Study Area (PSA) is located within central-western Inyo County, California (Figure 1). At the southern end the modifications begin near Summit Creek (Post Mile (PM) 29.2) and extend north to near Ash Creek Bridge (PM 41.8).

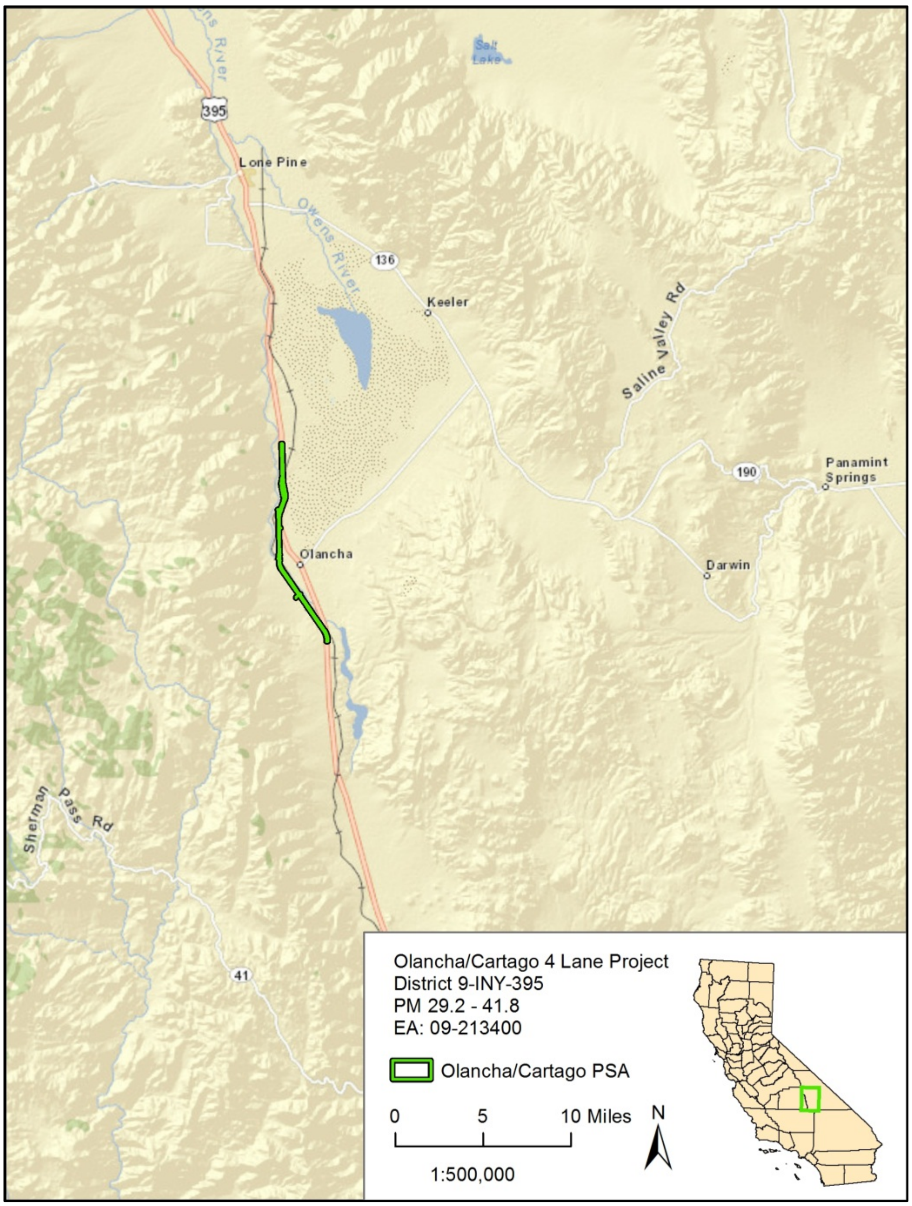

Figure 1. Project Vicinity

PROJECT DESCRIPTION

The California Department of Transportation (Caltrans) proposes to modify SR-395 near Olancha, Inyo County, California. As described in the Initial Study/Environmental Assessment dated August 2010, the preferred alternative selection was made after fully evaluating the environmental impacts and considering public and agency comments. The preferred alternative was selected after review of the Initial Study/Environmental Assessment, other project studies, comments received, survey results, input from public meetings, and the recommendation of the project development team. Specific criteria used to evaluate the project alternatives included safety, local public concerns, cost, interregional/regional public concerns, and impacts to the natural and physical environment. Ultimately, portions of Alternatives 3 and 4 were combined to create a preferred alternative that minimizes impacts and maximizes benefits of the project.

The preferred alternative will construct a controlled access, four-lane divided expressway or a partial conventional four-lane highway. It will begin in the existing four-lane section of U.S. SR-395 south of Olancha and will travel west of Olancha and the Los Angeles Aqueduct (Alternative 4). After crossing Olancha Creek, the alignment will cross the Los Angeles Aqueduct and continue north through Cartago along the existing highway to join the four-lane section of SR-395 to the north (Alternative 3). The northbound and southbound lanes will be separated by an unpaved median at least 100 feet wide. Posted traffic speeds on the divided highway will be set at 65 miles per hour.

The existing highway south of the intersection with State Route 190 East will be re-designated as State Route 190. The existing highway north of the intersection with State Route 190 East will be relinquished to Inyo County and will remain as a local route through Cartago. The terms and conditions of relinquishment will be determined through discussions with Inyo County.

Access from the existing highway to the new alignment will be available at Walker Creek Road, a new connector near the Crystal Geyser bottling plant, and at Lake Street and Inyo Street in Cartago. Additional access points may be included during project design pending discussions with Inyo County and other local agencies. Multi-purpose undercrossings will also be provided south of Olancha Creek to restore access to lands west of the new alignment in the Olancha area.

The construction of Alternatives 1, 2, 2A, or 3 would generate between 235,000 and 353,000 cubic yards of earthen material. Building Alternative 4 would require cuts as deep as 30 feet in some areas and would generate 618,000 cubic yards of earthen material. The preferred alternative will have cuts as deep as 75 feet. The proposed borrow site would be mined to a depth of approximately 10 feet deep.

PROJECT STUDY AREA

The Project Study Area (PSA) is the preferred alternative for the project and is mapped on the Haiwee Reservoir, Haiwee Pass, Vermillion Canyon, Olancha, and Bartlett 7.5' United States Geological Survey topographic maps, within the Mount Diablo Base Meridian (Table 1, Figure 2). The project includes approximately 12.6 linear miles of new alignment for SR-395, mostly west of the existing highway. Cut depths are estimated at a maximum of 75 feet for the road alignment. The proposed borrow site at the end of Fall Road and south of Olancha Creek (refer to Figure 2) will be mined to a depth of approximately ten feet.

Table 1. USGS 7.5' maps, township Ranges, and Sections

USGS 7.5' map	Townships and Ranges	Sections
Haiwee Reservoir	T20S, R37E	4, 5
Haiwee Reservoir	T19S, R37E	32
Haiwee Pass	T20S, R37 E	31
Vermillion Canyon	T19S, R 37E	29
Olancha	T19S, R37E	30, 19
Olancha	T19S, R36E	20, 17, 8, 5
Olancha	T18S, R36E	36, 25, 24, 13, 12

PROJECT PERSONNEL

Cogstone Resource Management Inc. prepared this document. Sherri Gust was the Principal Paleontologist. She supervised all work and prepared impact analysis, conclusions and recommendations. She has an M.S. in Anatomy (Evolutionary Morphology) from the University of Southern California, a B.S. in Anthropology from the University of California, Davis and over thirty years of experience in California. Kim Scott directed the survey and wrote the Resources Consulted, Survey and Sensitivity sections of the report. Scott has a M. S. in Biology with an emphasis in paleontology from California State University, San Bernardino and over 18 years of experience in California paleontology and geology. Courtney Richards assisted with the survey. Richards has an M.S. in Biology with a paleontology emphasis, and more than eight years of experience in west coast geology and paleontology. California Professional Geologist (#8787) Jay Schneider reviewed the entire report. He earned a Ph.D. in Geophysical Sciences from the University of Chicago, an M.S. in Geology from the University of Cincinnati, and a B.A. in Earth and Planetary Sciences from The Johns Hopkins University. Schneider has 23 years of experience in paleontology and environmental geology. Molly Valasik prepared the GIS maps throughout this report. Valasik has an M.A. in Anthropology, cross-training in paleontology and more than five years of G.I.S. experience. Short resumes are provided (Appendix A).

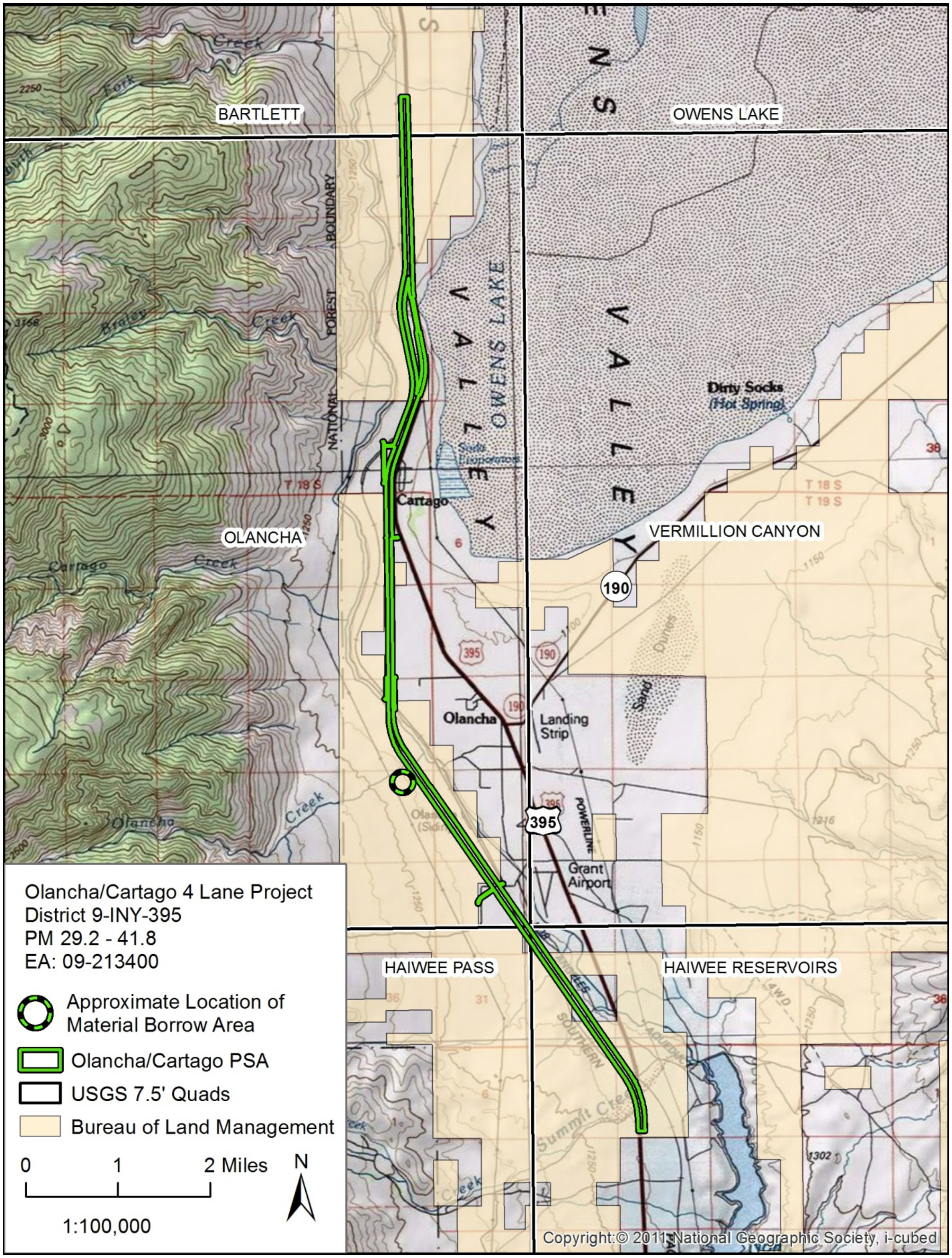

Figure 2. Project Location

REGULATORY ENVIRONMENT AND PERMITTING

This project is subject to federal, state and local legislation and guidelines regarding paleontological resources. For this project, federal regulations apply since most of the project in across BLM lands.

FEDERAL LAWS AND REGULATIONS

PALEONTOLOGICAL RESOURCES PROTECTION ACT

The Paleontological Resources Preservation Act (Public Law 111-011, Title VI, Subtitle D on Paleontological Resources Preservation) requires the Secretaries of the Interior and Agriculture to manage and protect paleontological resources on Federal land using scientific principles and expertise. The law affirms the authority for many of the policies the Federal land managing agencies already have in place for the management of paleontological resources such as issuing permits for collecting paleontological resources, curation of paleontological resources, and confidentiality of locality data. It only applies to Federal lands. It provides authority for the protection of significant paleontological resources on Federal lands including criminal and civil penalties for fossil theft and vandalism. The act states (in part):

a) The term ‘‘paleontological resource’’ means any fossilized remains, traces, or imprints of organisms, preserved in or on the earth’s crust, that are of paleontological interest and that provide information about the history of life on earth.
b) The Secretary shall manage and protect paleontological resources on Federal land using scientific principles and expertise.
c) The Secretary shall develop appropriate plans for inventory, monitoring, and the scientific and educational use of paleontological resources, in accordance with applicable agency laws, regulations, and policies. These plans shall emphasize interagency coordination and collaborative efforts where possible with non-Federal partners, the scientific community, and the general public.
d) A paleontological resource may not be collected from Federal land without a permit issued under this subtitle by the Secretary.
e) The Secretary may issue a permit for the collection of a paleontological resource pursuant to an application if the Secretary determines that:

    1) the applicant is qualified to carry out the permitted activity;
    2) the permitted activity is undertaken for the purpose of furthering paleontological knowledge or for public education;
    3) the permitted activity is consistent with any management plan applicable to the Federal land concerned; and
    4) the proposed methods of collecting will not threaten significant natural or cultural resources.

f) A permit for the collection of a paleontological resource issued under this section shall contain such terms and conditions as the Secretary deems necessary to carry out the purposes of this subtitle. Every permit shall include requirements that:

   1) the paleontological resource that is collected from Federal land under the permit will remain the property of the United States;
   2) the paleontological resource and copies of associated records will be preserved for the public in an approved repository, to be made available for scientific research and public education; and
   3) specific locality data will not be released by the permittee or repository without the written permission of the Secretary.

g) Any paleontological resource, and any data and records associated with the resource, collected under a permit, shall be deposited in an approved repository. The Secretary may enter into agreements with non-Federal repositories regarding the curation of these resources, data, and records.

h) Information concerning the nature and specific location of a paleontological resource shall be exempt from disclosure under section 552 of title 5, United States Code, and any other law unless the Secretary determines that disclosure would further the purposes of this subtitle, not create risk of harm to or theft or destruction of the resource or the site containing the resource and be in accordance with other applicable laws.

NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) directs federal agencies to use all practicable means to "Preserve important historic, cultural, and natural aspects of our national heritage…" (42 USC 4321 Section 101(b) (4)). Regulations for implementing the procedural provisions of NEPA are found in 40 CFR 1500 1508.

If the presence of a significant environmental resource is identified during the scoping process, federal agencies and their agents must take the resource into consideration when evaluating project effects. Consideration of paleontological resources may be required under NEPA when a project is proposed for development on federal land, or land under federal jurisdiction. The level of consideration depends upon the federal agency involved.

FEDERAL-AID HIGHWAY ACT OF 1935 (20 USC 78)

Section 305 of the Federal Aid Highway Act of 1956 (20 USC 78, 78a) gives authority to use federal funds to salvage archaeological and paleontological sites affected by highway projects.

FEDERAL LAND POLICY AND MANAGEMENT ACT

This legislation established public land policy and guidelines for the administration, management, protection, development, and enhancement of public lands (FLPMA). This includes the procedures the U.S. Bureau of Land Management (BLM) follows in managing public lands. Elements of FLPMA that could apply to energy development activities are the Federal Land Transaction Facilitation Act (43 USC 2301 et seq.) and the Federal Land Exchange Facilitation Act (43 USC 1716), which address land sales, disposals, and exchanges. The full suite of regulations promulgated by the BLM is available at 43 CFR 1600-9260. Although FLPMA addresses the management of public lands, not tribal lands, the BLM must comply with FLPMA regulations when it is involved in reviewing and approving energy development activities on tribal lands.

ANTIQUITIES ACT

The Antiquities Act of 1906 states, in part: That any person who shall appropriate, excavate, injure or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the Government of the United States, without the permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated, shall upon conviction, be fined in a sum of not more than five hundred dollars or be imprisoned for a period of not more than ninety days, or shall suffer both fine and imprisonment, in the discretion of the court.

Although there is no specific mention of natural or paleontological resources in the Act itself, or in the Act's uniform rules and regulations (Title 43 Part 3, Code of Federal Regulations (CFR)), "objects of antiquity" has been interpreted to include fossils by the National Park Service, the Bureau of Land Management, the Forest Service, and other Federal agencies.

ARCHAEOLOGICAL AND PALEONTOLOGICAL SALVAGE

Title 23 United States Code (USC) 305 refers to the Antiquities Act of 1906. Specifically, it states: Funds authorized to be appropriated to carry out this title to the extent approved as necessary, by the highway department of any State, may be used for archaeological and paleontological salvage in that state in compliance with the Act entitled "An Act for the preservation of American Antiquities," approved June 8, 1906 (Public Law 59-209; 16 USC 431-433), and State laws where applicable.

This statute allows funding for mitigation of paleontological resources recovered pursuant to Federal aid highway projects, provided that "excavated objects and information are to be used for public purposes without private gain to any individual or organization".

STATE LAWS AND REGULATIONS

Paleontological resources are protected by state law. This protection covers all vertebrate fossils (animals with backbones) and any unique paleontological locality.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

CEQA (Chapter 1, Section 21002) states that: It is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required are intended to assist public agencies in systematically identifying both the significant effects of proposed projects and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects.

If paleontological resources are identified during the Preliminary Environmental Analysis Report (PEAR), or other initial project scoping studies (e.g., Paleontological Evaluations Report (PER), Preliminary Environmental Study (PES), etc.), as being within the proposed project area, the sponsoring agency (Caltrans or local) must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the resource.

PUBLIC RESOURCES CODE (PRC)

Section 50987.5 states that no person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any … vertebrate paleontological site, including fossilized footprints, …, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

PERMITTING REQUIREMENTS

Depending on the arrangements between Caltrans and the BLM, a current BLM permit and fieldwork authorization may required.

RESOURCE CONTEXT

GEOLOGIC SETTING

The Olancha-Cartago 4-Lane Project is in the Basin and Range geologic province, a unique physiographic region characterized by numerous parallel mountain ranges separated by narrow arid valleys or basins.

Internally draining valleys without external discharge (i.e. closed basins) are common to the Basin and Range. These valleys collect precipitation, precipitation runoff, and in some cases groundwater, into areas of standing water that completely evaporates/percolates seasonally to form playas or dry lake beds. Pleistocene fossils have been found in many playa or lacustrine deposits throughout the Basin and Range, including sediments in Owens Lake.

The presence of older fossils in the Basin and Range Province results from the exposure of previously buried sedimentary units and fossiliferous formations uplifted by faulting brought about by crustal extension.

Relative to the Basin and Range Province, the PSA is in the Owens Valley, which is bordered by the Sierra Nevada Mountains to the west and the White Inyo Mountains to the east. Owens Lake playa is immediately east of the northern half of the PSA.

STRATIGRAPHY

Geologic mapping by Mathews and Burnett (1965) and Stinson (1977a, 1977b) indicates that the surficial deposits of the entire alignment consists of Quaternary alluvium and Quaternary alluvial fans. At depth Quaternary older alluvium and potentially Quaternary older alluvial fans may be encountered, and at the southern end of the project the Pliocene Coso Formation may also be encountered. During the field reconnaissance, fossiliferous Quaternary and Quaternary older fluvio-lacustrine deposits were also encountered in a portion of the alignment.

QUATERNARY ALLUVIUM

Late Quaternary deposits range from 11,000 years ago to the present (Holocene Epoch). Within the PSA the Quaternary alluvium consists of poorly consolidated silts and sands on the valley floors. This material coarsens to include pebbles with increasing elevation as the material transitions to the alluvial fans and slope debris of the valley edges (Mathews and Burnett 1965; Stinson 1977a, 1977b).

QUATERNARY ALLUVIAL FANS

Late Quaternary deposits range from 11,000 years ago to the present (Holocene Epoch). Quaternary alluvial fans include pebbles to boulder sized clasts in a sandy to silty matrix. Locally, the upper five to ten feet are caliche cemented and many of the fans are slightly dissected. Material occurs along the valley edges as it is shed from the surrounding mountains as debris flows (Stinson 1977a, 1997b). As alluvial fans reach valleys they transition to fluvial (river) sediments and lake deposits when there is enough water. In a situation like Owen's Valley where the mountainsides are so close to the valley floor with a lake, sublacustrine alluvial fan-fluvial sediments can be deposited.

QUATERNARY AND QUATERNARY OLDER ALLUVIAL-LACUSTRINE DEPOSITS

The surface and margins of Owens Dry Lake are mapped as Quaternary (<11,000 years old) lake, playa, alluvial, stream wash and slope debris deposits consisting of unconsolidated clays, silts, sands, and granitic fanglomerates (Mathews and Burnett 1965; Stinson 1977 b).

QUATERNARY OLDER ALLUVIUM

Older Quaternary deposits range in age from 2.6 million to 11 thousand years old (Pleistocene Epoch). Deposits consist of poorly to moderately well bedded fanglomerates along the valley edges that are locally dissected. Sediments are pebble to boulder size in weakly clayey matrix. Locally, the upper five to ten feet are caliche cemented. Although not mapped at the surface within the PSA, Quaternary older alluvium from the Coso Range may occur at depth at the southern end of the PSA.

COSO FORMATION

The formation includes approximately 300 feet of rhyolitic tuff, red shaley and arkosic material, and buff-colored arkose and clay with Pliocene to Pleistocene aged vertebrate fossils present in lacustrine deposits. Although not mapped at the surface within the PSA, sediments of the 6.0 to 2.5 million year old (latest Miocene to Pliocene Epochs) Coso Formation may occur at depth at the southern end of the project (Bacon et al. 1982).

Three units are present within the Coso Formation: a fanglomerate, rhyolitic pyroclastic rocks, and lacustrine deposits (Stinson 1977a).

Coso Formation - Fanglomerate

Pebble to cobble conglomerate with coarse grained sandstone which is crossbedded and has been extensively silicified. Forms large, lens-like, massive masses up to 50 feet thick on west slope of Haiwee Ridge. Locally underlain or interbedded with buff-colored silicified rhyolitic tuff, but primarily deposited on an irregular erosional surface of underlying granitic rock. Thins westward where the unit is overlain by pyroclastic rock and arkosic sandstone (Stinson 1977a).

Coso Formation – Rhyolitic pyroclastic rocks

White to buff rhyolitic vitric tuff, pumice lapilli tuff, and tuff breccia. Chunks of pumice up to 6 inches in diameter in locally silicified tuff breccia. Includes brown silicified tuff 10 to 30 feet thick. 500 foot maximum thickness near the south end of Haiwee Ridge (Stinson 1977a).

Coso Formation – Lacustrine Deposits

White to buff clay to sandstone, with thin-bedded limestone. Volcanic debris reworked and present in various amounts. Ripple marks common and some beds of finer-grained tuffaceous material display slumping. Pale-green to grey, limy sandstone and siltstone are resistant to weathering and frequently forms caprock over less-resistant tuffaceous sediments. This unit is fossiliferous with a Blancan (Stinson 1977a; Hall et al. 1936; Bacon et al. 1982; Cassiliano 1999; Lindsay et al. 2002) to Hemphillian (Hunt 1988) vertebrate fauna.

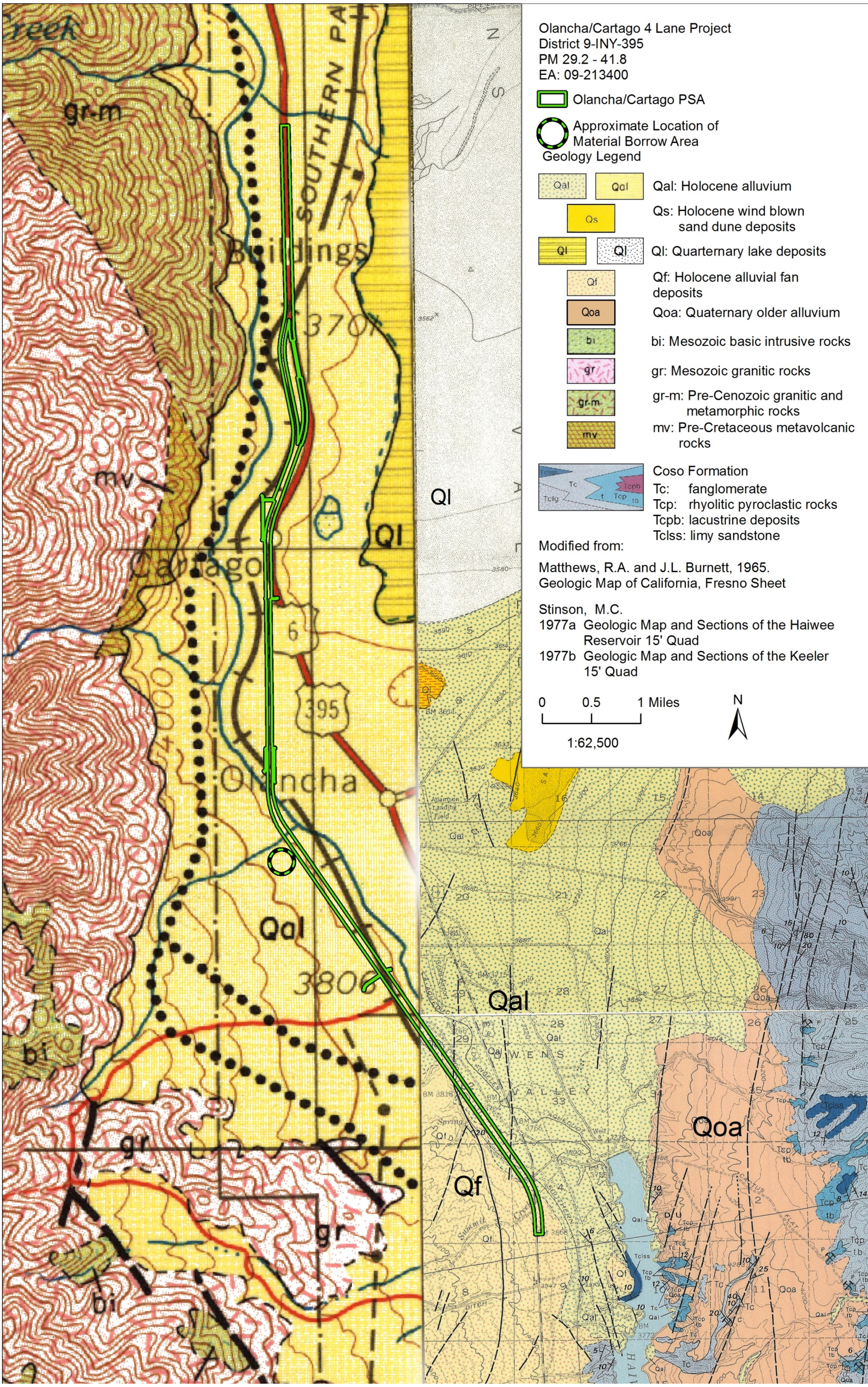

Figure 3. Geology Map

KNOWN PALEONTOLOGICAL RESOURCES

Searches for paleontological records were completed by the Los Angeles County Museum of Natural History (LACM; McLeod 2013), the University of California Museum of Paleontology (UCMP; Holroyd 2013), at the Eastern California Museum, in published materials (Hay 1927; Jefferson 1989, 1991a, 1991b), and online resources (Paleobiology Database 2013). A 2002 records search completed by the San Bernardino County Museum (SBCM; Scott 2002) for Owens Lake was also reviewed. Copies of the records searches are provided (Appendix B).

There are no previously referenced fossil localities within the PSA. Fossils are known within one mile of the PSA from Quaternary deposits and the Coso Formation (Table 2, 3, 4). Many more fossils are known north and east of the project area in association with Owens Lake and its associated river channels (Gust 2003).

QUATERNARY DEPOSITS

South of Owens Lake along its drainage path southeast of Olancha, a Pleistocene mammoth (Mammuthus columbi) fossil is recorded near the current dam for the North Haiwee Reservior. It was collected by William Mulholland during construction of the Los Angeles Aqueduct (Figure 4; McLeod 2013).

Figure 4. Columbian mammoth tooth (LACM 4538)

COSO FORMATION

Multiple 6.0 to 2.5 million year old fossils are known from the Coso Formation near the southern terminus of the PSA near Haiwee Reservoir. These animals include bone-crushing and hyena-like dogs (*Borophagus*, *Epicyon*), bear (*Agriotherium*), cougar (*Felis* sp.), southern mammoth (*Mammuthus meridianalis*), mastodon (*Mammut cosoensis*), horses (*Plesippus francescana*, *Equus simplicidens*, *Equus* sp.), camel (*Camelops* sp.), llamas (*Hemiauchenia* sp., *Tanupolama* sp.), peccary (*Platygonus* sp.), along with rabbits, rodents, birds, and fish (McLeod 2013; Appendix B).

FIELD RECONNAISSANCE

A field survey to assess the sediments and potential impacts was conducted on September 18 and 19, 2013 by Kim Scott and Courtney Richards. The survey consisted of a windshield survey of the PSA (or adjacent to the PSA) followed by a pedestrian survey of those sediments determined conducive to fossil preservation as they were encountered. Photographs were taken to document specific features of the proposed project area. Sediments were assigned to formations based on pre-existing geological mapping (Matthews and Burnett 1965; Stinson 1977a, 1977b) and observations of sediment color, consistency and depositional environment.

Ground visibility was good to excellent along the PSA with only a small portion of the area obscured by sagebrush scrubland, Joshua trees, cottonwood, and creosote. Fauna observed included a great horned owl, zebra tailed lizards, wood rats, and ground squirrels.

The majority of the PSA consists of Holocene proximal alluvial fan and debris flow deposits off the Sierra Nevada Mountains located west of the PSA. These coarse grained deposits are composed of sand, pebbles, cobbles, and boulders up to 5 feet in diameter (Figure 5, 6).

Figure 5. Debris flow at approximately station 100

Figure 6. Boulders at the surface of the alluvial fan at approximately station 475

To the east of the PSA, lacustrine deposits of Owens Lake interfinger with the debris flows and alluvial fans of the Sierra Nevada Mountains. At the lake margin parallel to stations 420 to 570 and beyond the PSA, these alluvial fans transition into trough crossbedded fluvial deposits of sands with pebbles and cobbles as they feed into the lake (Figure 7). Within the same area of the PSA, fine grained lake sediments are occasionally exposed. These deposits are visible in outcrops along SR-395 underlying the proximal fan deposits at depths as shallow as a foot, and in some cases, are exposed at the surface. Lacustrine sediments consist of buff to light brown sandy silt with scattered pebbles and cobbles (Figure 8) and occur at the surface adjacent to stations 52-70, 80-120, 240-275, and 375-390. These are most likely part of the Owens Lake sediments as well, although further investigations would be required to confirm this.

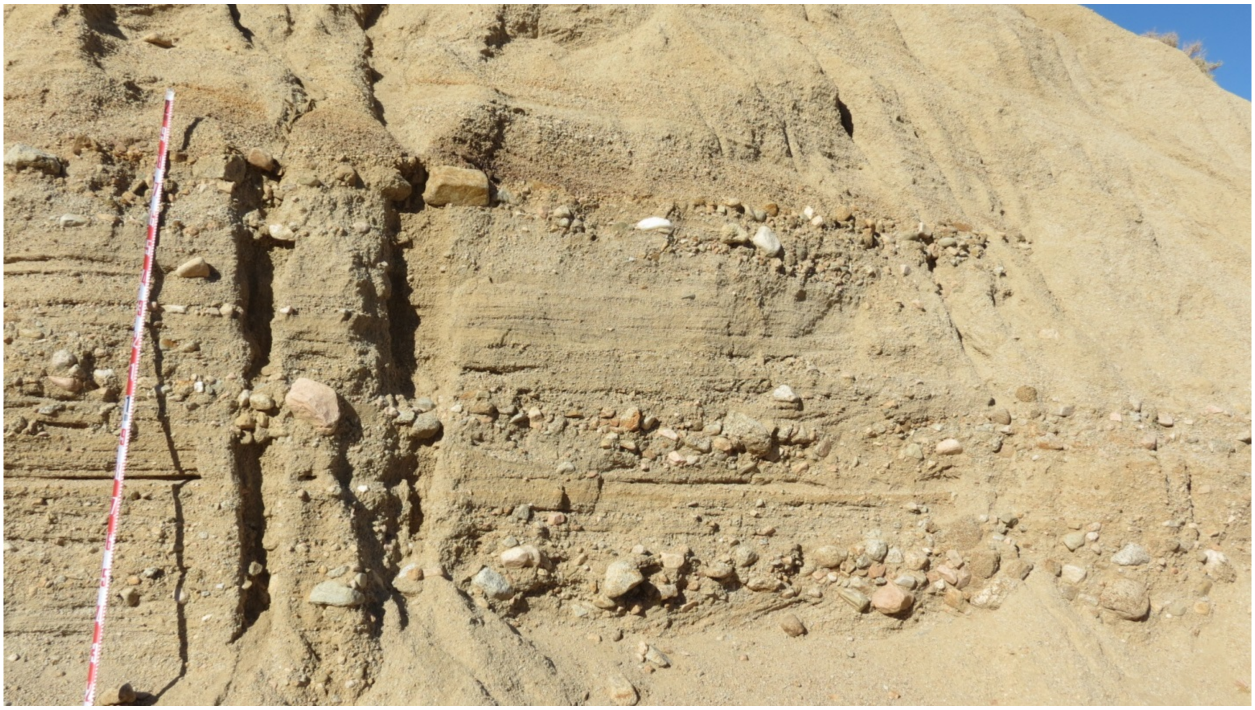

Figure 7. Trough crossbedded fluvial deposits adjacent to Owens Lake near station 475

Red and white scale intervals are decimeters

Figure 8. Fossiliferous Quaternary older lake deposits at station 450

Paleontological resources were observed at one outcrop of lacustrine sediments at station 450 within the PSA. Fossils were photographed, assigned unique field numbers, and context and stratigraphic data were recorded. Location data of all fossils were recorded using a Trimble Geo6000 unit (high resolution GPS). All fossils were found in buff to light brownish grey sandy silt with scattered pebbles and cobbles. A total of ten fossil localities were recorded (Figure 9). Specimens observed included fresh water snail (*Planorbidae*), fish (Osteichthyes), odd-toed ungulate (Perissodactyla, probably a horse), rodent (Rodentia), and unidentified small to medium sized mammals (Mammalia) (Table 2, Figures 9-11).

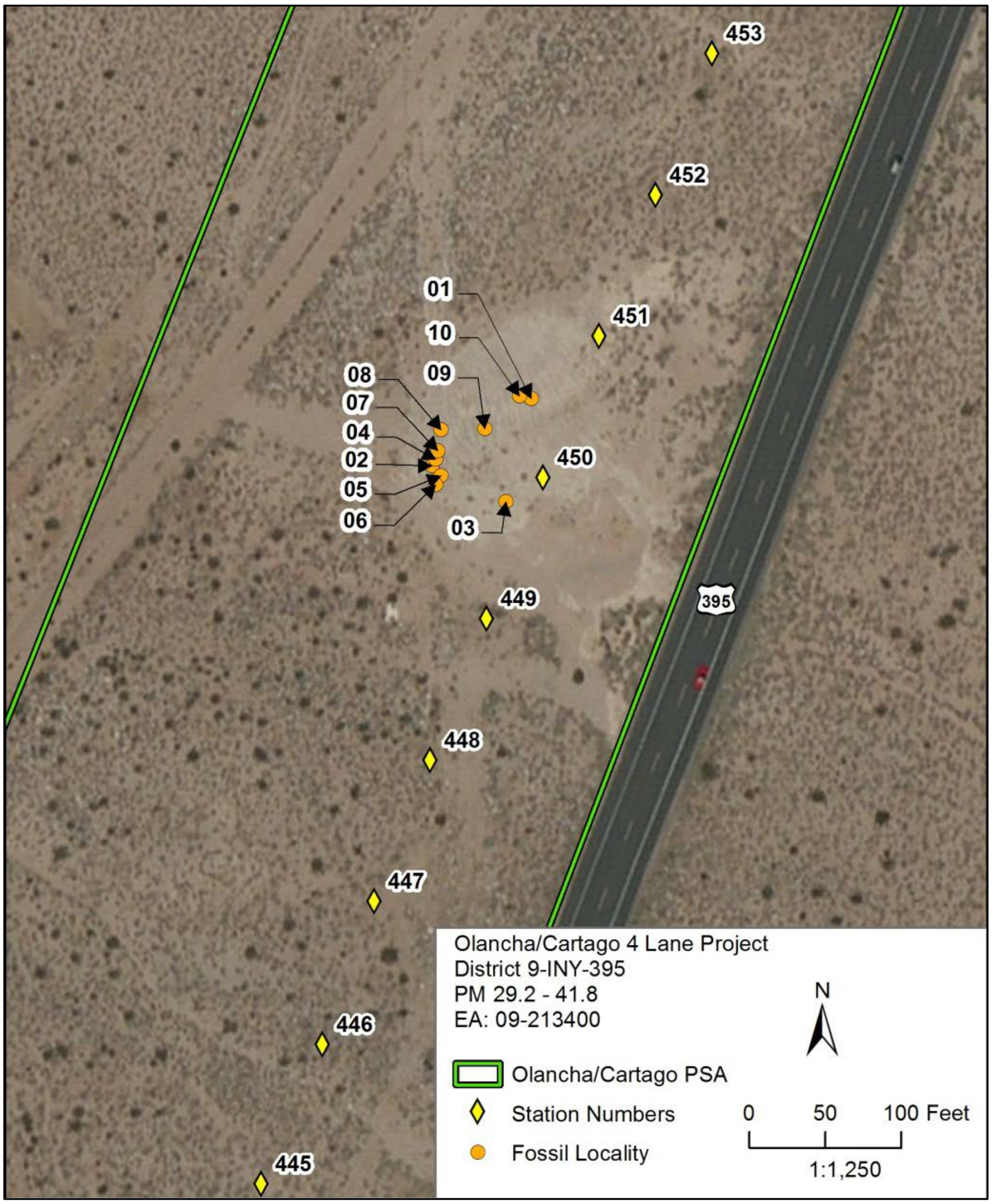

Figure 9. Locality map of fossils found during the survey

Table 2. Fossils Recorded on Survey

Locality	Common Name	Scientific Name	Element	Count
1	fresh water snail	Planorbidae	shell	1
2	vertebrate	Vertebrata	bone fragments	2
3	mammal, small	Mammalia	lumbar vertebra	1
4	gopher	*Thomomys*	right maxilla and incisor	1
5	fish	Osteichthyes	vertebrae	2
	fish	Osteichthyes	bone fragments	4
	mammal, small	Mammalia	bone fragment	1
6	odd toed ungulate	Perissodactyla	distal metapodial	1
7	mammal, large	Mammalia	distal radius	1
8	fish	Osteichthyes	skull fragment	1
9	fish	Osteichthyes	vertebra	1
10	fish	Osteichthyes	dentary	1

The presence of the odd-toed ungulate material dates the fossils to at least the Pleistocene Epoch as horses, tapirs, and rhinos had all gone extinct in North America by the end of the Pleistocene. Based on the appearance of the sediments and proximity to Owens Lake, these fossils are conditionally assigned to the latest Pleistocene.

Outcrops of the Coso Formation located to the east of the PSA were also included in the reconnaissance in order to assess their suitability for fossil preservation should they be encountered during deep excavations at the southern end of the project. The sediments consisted of greyish pink to pale green fluvio-lacustrine silts and clays with pebble to cobble channels.

PALEONTOLOGICAL SENSITIVITY

Caltrans utilizes a tripartite scale to characterize paleontological sensitivity consisting of no, low and high (Caltrans 2012; Appendix C). A multilevel ranking system was developed by professional resource managers as a more practical tool, the Potential Fossil Yield Classification system (PFYC; BLM 2007; Appendix C).

Using the PFYC system, geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts. This ranking is not intended to be applied to specific paleontological localities or small areas within units. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher PFYC value; instead, the relative abundance of localities is intended to be the major determinant for the value assignment.

Fossils were only observed in one outcrop of the PSA (at ST. 450), however, the entire area of fluvio-lacustrine sediments adjacent to Owens Lake has a high potential to yield significant fossil resources (Sta. 420 to 570). Several additional areas of fine-grained lacustrine sediments at the surface (Sta. 375-390, 240-275, 80-120 and 52-70) are most likely part of the Owens Lake sediments as well, although further investigations would be required to confirm this. Additional fine-grained sediments including the Coso Formation lacustrine deposits may be encountered subsurface, particularly in the large borrow are cut near station 250.

Quaternary alluvium, Quaternary lake/Quaternary older lake, Quaternary older alluvium, and (if present) the Coso Formation all are ranked PFYC 3a and have potential to produce significant vertebrate fossils. The Quaternary alluvial fans and Quaternary older alluvial fans are assigned a PFYC 2 or low sensitivity (Table 3; Figure 10, 11) due to their coarse nature.

Table 3. Paleontological Sensitivity Rankings

Caltrans ranking	**high**			**low**		**no**
PFYC ranking	**5: very high**	**4: high**	**3a: moderate-patchy**	**3b: moderate-undemonstrated**	**2: low**	**1: very low**
Rock Units						
Quaternary alluvium			X			
Quaternary alluvial fan					X	
Quaternary and Quaternary older alluvium, fluvio-lacustrine			X			
Quaternary older alluvium			X			
Quaternary older alluvial fan					X	
Coso Formation (if present)			X			

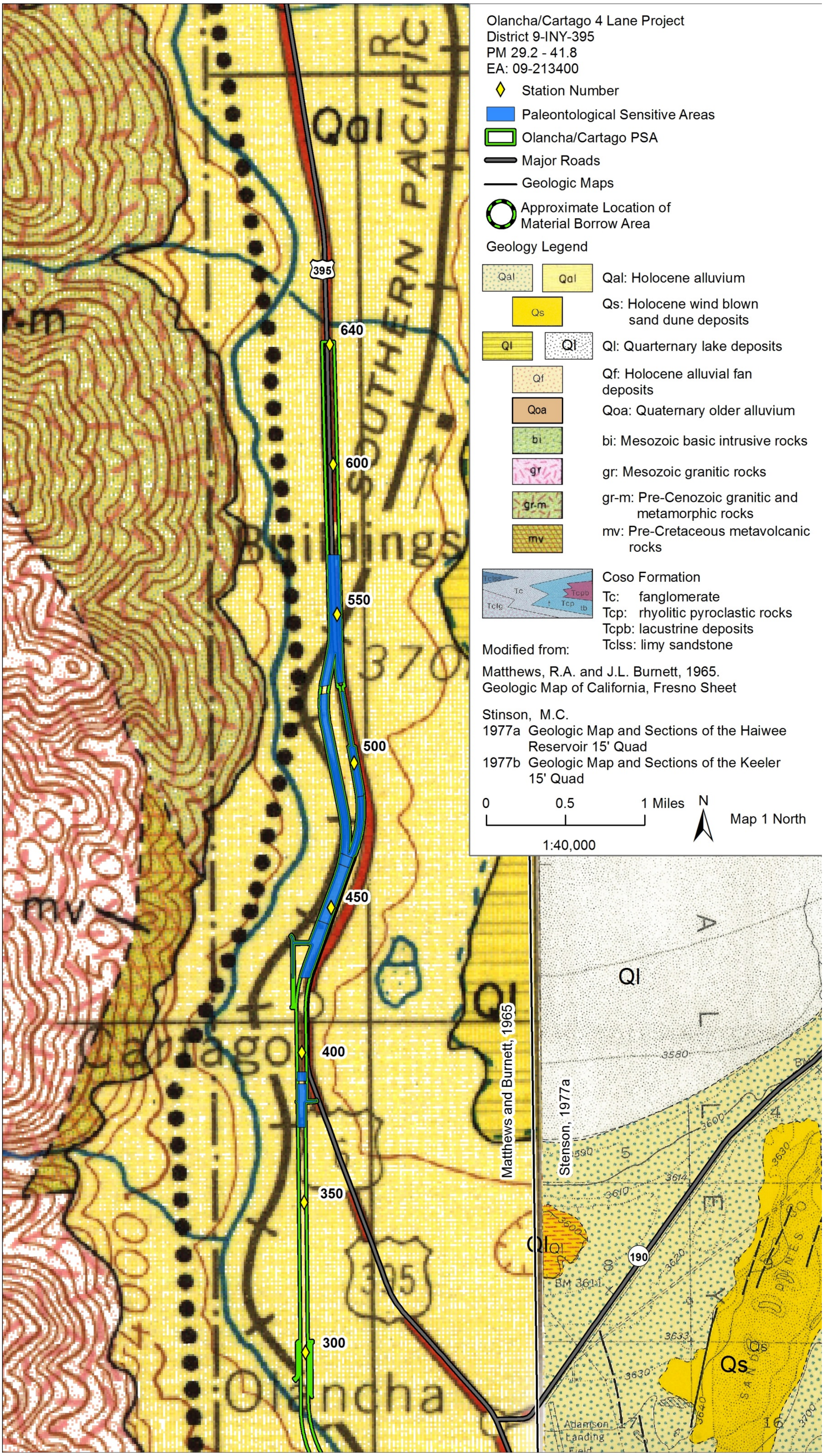

Figure 10. Paleontological sensitivity of the northern portion of the PSA

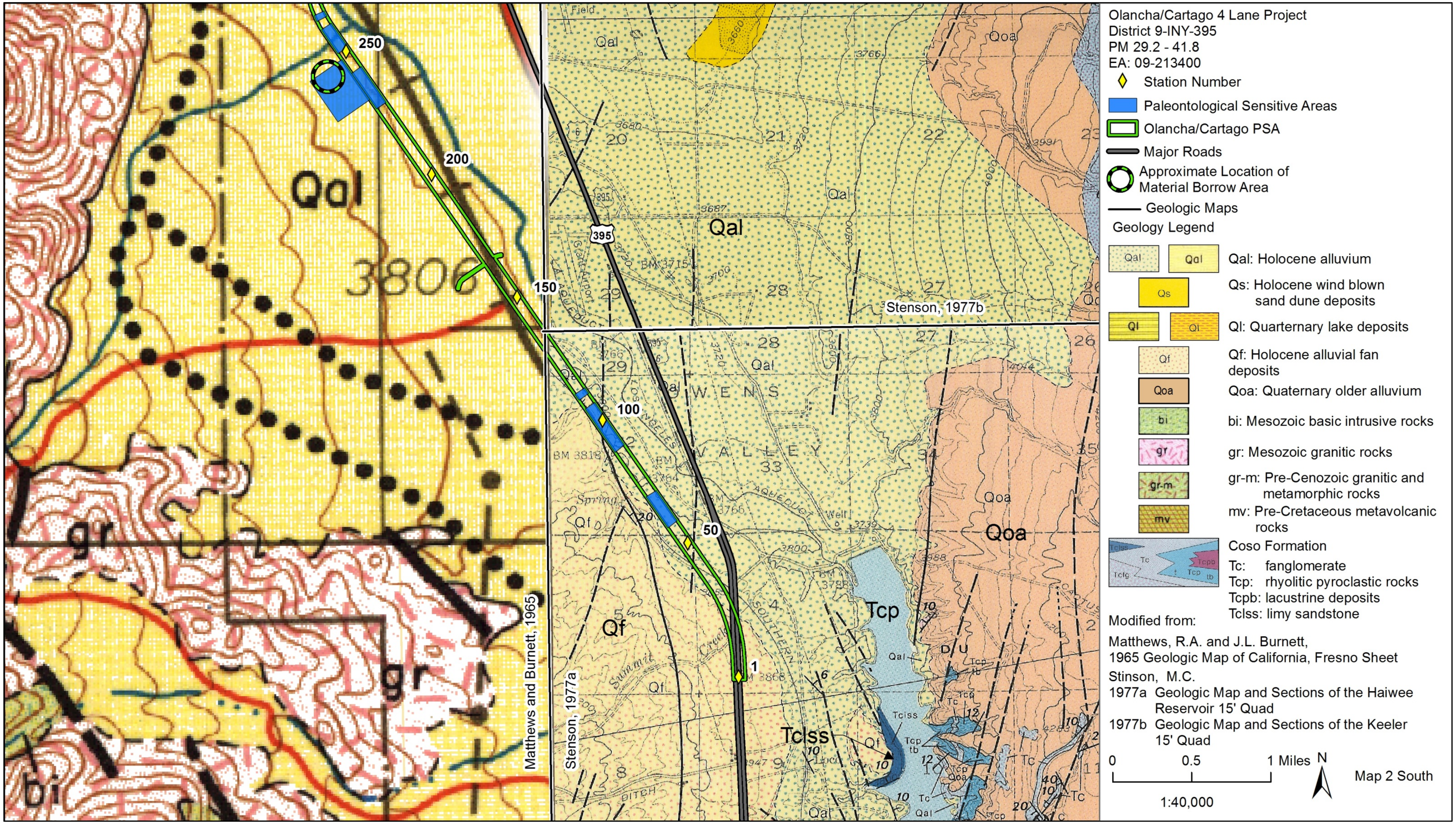

Figure 11. Paleontological sensitivity of the southern portion of the PSA

IMPACT ANALYSIS

BASELINE CONSIDERATIONS

The Quaternary alluvium, Quaternary older alluvium, Quaternary to Quaternary older fluvio-lacustrine, and the Coso Formation have been demonstrated to be the only paleontologically sensitive sediments within the PSA that may be affected by project activities. Caltrans guidance for evaluating fossil deposits and sensitivity of resources states:

> Regardless of the format used by a paleontologist to rank formations, the importance of any rock unit must be explicitly stated in terms of specific fossils known or suspected to be present (and if the latter, why such fossils are suspected), and why these fossils are of paleontological importance. Some land-managing agencies may require the use of specific guidelines to assess significance whereas others may defer to the expertise of local paleontologists and provide little guidance. Because each situation may differ, it is important that there is a clear understanding between project staff (Caltrans or local), consultants, and personnel from other agencies as to exactly what criteria will be used to assess the significance of rock units affected by a particular project.
>
> As a practical matter, no consideration is generally afforded paleontological sites for which scientific importance cannot be demonstrated. If a paleontological resource assessment results in a determination that the site is insignificant or of low sensitivity, this conclusion should be documented in a Paleontological Evaluation Report (PER) and in the project's environmental document in order to demonstrate compliance with applicable statutory requirements.
>
> If a paleontological resource is determined to be significant, of high sensitivity, or of scientific importance, and the project impacts it, a mitigation program must be developed and implemented. Mitigation can be initiated prior to, and/or during, construction. The latter is more common for Caltrans projects. It should be pointed out, however, that mitigating during construction poses a greater risk of construction delays. Mitigation is an eligible federal project cost, in accordance with 23 U.S.C. 305, only if acceptable significance documentation is submitted. Thus, coordination between Caltrans, FHWA, and all jurisdictional agencies is critical to formally establishing the significance of a resource. [PER Instructions, Chapter 8, Vol. 1, SER, http://www.dot.ca.gov/ser/vol1/sec3/physical/Ch08Paleo/chap08paleo.htm, accessed August 14, 2012]

DEFINITION OF SIGNIFICANCE FOR PALEONTOLOGICAL RESOURCES

Only qualified, trained paleontologists with specific expertise in the type of fossils being evaluated can determine the scientific significance of paleontological resources. Fossils are considered to be significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;

2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life;
5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

As so defined, significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important (Scott and Springer 2003; Scott et al. 2004).

SIGNIFICANCE EVALUATION

Road widening, grading, trenching and borrowing for this project will affect Pleistocene to early Holocene Quaternary sediments. The Pliocene Coso Formation may be affected if encountered during deep excavations near the southern end of the project.

The survey found an area of lacustrine sediments with fossils exposed on the surface and several areas with fine-grained sediments at the surface (Sta. 52-70, 80-120, 240-275, 375-390, and 420-570) as observed during the survey and documented on the sensitivity maps. However, additional fine-grained sediments may be revealed by project excavations.

Earthmoving may reveal fossils or fossil assemblages *in situ* however, the local fluvial and lacustrine environment is likely to have disarticulated most skeletons. Significance will need to be assessed subsequent to recovery and identification per the criteria presented above.

CONCLUSIONS AND RECOMMENDATIONS

Pleistocene fossils were located on the surface of the PSA during the survey and additional fossils are anticipated to be revealed by project earthmoving. A Paleontological Mitigation Plan is recommended to guide the paleontological mitigation of preconstruction collection and monitoring during qualifying excavation activites.

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1977b Geologic map of the Keeler 15'quadrangle, Inyo County, California. *California Division of Mines and Geology* map sheet 38, 1:62,500.

APPENDIX A. QUALIFICATIONS

SHERRI GUST
Project Manager & Principal Paleontologist

EDUCATION

1994 M. S., Anatomy (Evolutionary Morphology), University of Southern California, Los Angeles
1979 B. S., Anthropology (Physical), University of California, Davis

SUMMARY QUALIFICATIONS

Gust has more than 34 years of experience in California, acknowledged credentials for meeting national standards, and is a certified/qualified principal paleontologist in all California cities and counties that maintain lists. She is a Member of the Society of Vertebrate Paleontology, Society for Economic Sedimentology and Paleontology, and others. Gust holds current statewide BLM paleontology permits in California and Nevada. She has special expertise in the identification and analysis of human, animal and fossil bone.

SELECTED PROJECTS

Regional Express Lanes Network Phase I Project Approval/Environmental Document Project, Caltrans District 4, Metropolitan Transportation Commission, Alameda, Contra Costa, and Santa Clara Counties, CA. Project Manager and Principal Paleontologist. Identified paleontological resources and sensitive sediments within the proposed 2,472 acre project area. Services included a paleontological record search, background research, impact analysis, and GIS constraints mapping. Prepared a Draft and Final Paleontological Identification Report (PIR). 2012-2013

US 101 Express Lanes Project, Caltrans District 4, Santa Clara County, CA. Project Manager and Principal Paleontologist. The 37-mile linear project entails freeway widening and HOV lane conversion along US 101 and SR 85 (North). Prepared Paleontological Evaluation Report and Mitigation Plan. Performed quality control on Archaeological Survey Report and Data Recovery Plan prepared by Cogstone. 2012-ongoing

Savage Way Rehabilitation, Caltrans District 10, San Joaquin and Calaveras counties. Project Manager and Principal Paleontologist. Prepared a revised Paleontological Mitigation Plan and supervised paleontological monitoring during construction. No fossils were observed or recovered. Prepared Paleontological Monitoring Report. 2012-2013

Arboleda Drive Freeway Project, Caltrans District 10, Merced. Project Manager and Principal Paleontologist. Paleontological Monitoring for 5 mile segment of State Route 99 south of Merced. Some 128 localities and 1667 fossils recovered in five months of excavation for detention basins. 2012.

Plainsburg Interchange Project, Caltrans District 10, Chowchilla. Project Manager and Principal Paleontologist. Paleontological Mitigation Plan with updated assessment for 5.5 mile new road segment and interchange on State Route 99 between Chowchilla and Merced. 2012.

SR 99 Widening, Caltrans District 10, South Stockton. Project Manager and Principal Paleontologist. Paleontological Mitigation Plan for project that involves widening SR 99 from four-lanes to six lanes and improvements to multiple interchanges. 2012

KIM SCOTT
Field & Lab Director for Paleontology

EDUCATION

2000 B.S., Geology with paleontology emphasis, University of California, Los Angeles
2013 M.S., Biology with a paleontology emphasis, California State University, San Bernardino

SUMMARY QUALIFICATIONS

Scott has more than 18 years of experience in California paleontology. She is a qualified geologist and field paleontologist with extensive survey, monitoring and fossil salvage experience. In addition, she has special skills in fossil preparation (cleaning and stabilization) and preparation of stratigraphic sections and other documentation for fossil localities. Scott serves as company safety officer and is the author of the company safety and paleontology manuals.

SELECTED PROJECTS

Ranchero Road-BNSF Grade Separation, City of Hesperia, Hesperia. Directed paleontological resources monitoring for the duration of all ground disturbing activities in native sediments greater than five feet deep. Field Director and Report Co-author. 2011-2013

Merced Freeway Project, Caltrans District 10, Merced. Alternated 2 week rotations performing direction of fossil recovery and field preparation of fossils for 5 mile segment of State Route 99 south of Merced. Some 128 localities and 1667 fossils recovered in five months of excavation for detention basins. Contributed to final report. Field / Lab Director and Report Contributor. 2012

HECTF, Southern California Edison, Daggett. Conducted paleontological Survey and authored report for training facility in San Bernardino County, CA. Field and Lab Director. 2011-2012

SR 41 Widening, Caltrans District 6, near Kettleman City. Directed monitoring for widening and rehabilitating of an 8.5 mile segment of Highway 41 near Kettleman City. Supervised preparation of about 800 vertebrate, invertebrate and plant fossils recovered, prepared stratigraphic columns and contributed to preparation of Paleontological Monitoring Report. Field / Lab Director and Report Contributor. 2012

Devers-Mirage 115 KV System Split Project, Southern California Edison, Riverside County. Performed preconstruction paleontological survey, directed paleontological monitoring during construction activities and co-authored monitoring compliance report associated with electrical systems upgrade in of Cathedral City, Indian Wells, Palm Desert, Palm Springs, Rancho Mirage, Thousand Palms and unincorporated Riverside County. Field and Lab Director. 2011

Geospatial Paleontology Database, Caltrans District 6, 9, and 10. Conducted paleontological research for 15 counties in central and eastern California for paleontological screening tool. Paleontology Researcher. 2011-2012

Tehachapi Renewable Transmission Project, Segments 1-3, Southern California Edison, Los Angeles and Kern counties. Co-authored paleontological resources management plans and directed paleontological monitoring for construction of new electrical transmission facilities. Paleontology Field and Lab Director and Report Co-author. 2007-2009

El Casco Substation Project, Southern California Edison, Riverside County. Performed preconstruction mitigation measures and prepared portions of Paleontological Resources Treatment Plan. Field and Lab Director and Report co-author. 2009

COURTNEY RICHARDS
Paleontologist

EDUCATION

2011	M.S., Biological Sciences, Marshall University
2006	B.S., Earth and Space Science, University of Washington

SUMMARY QUALIFICATIONS

Richards is a qualified paleontologist with research, field, and laboratory experience. She earned her Bachelor's degree in Earth and Space Science at the University of Washington and her Master's degree in Biological Sciences with a paleontology focus at Marshall University. Richards has published papers on dinosaur and marine reptile paleontology research. Richards has personal expertise in fossil salvage, stratigraphy, fossil preparation, database analysis and identification. She has two years of professional experience in California.

SELECTED PROJECTS

Pioneer High School Project. Report Contributor. Prepared paleontology and geology sections of a combined archaeological and paleontological resources assessment report for a stadium improvement project at Pioneer High School in Whittier, Los Angeles County. 2013.

Merced Freeway Project, Caltrans District 10. Assistant Field and Lab Director. Alternated 2 week rotations performing direction of fossil recovery and field preparation of fossils for 5 mile segment of State Route 99 south of Merced. Some 128 localities and 1667 fossils recovered in five months of excavation for detention basins. Prepared fossils in lab and supervised matrix washing and microfossil sorting. Contributed to final report including preparation of stratigraphic columns. 2012.

Los Angeles International Airport (LAX) Northside Plan Update. Paleontology Technician. Performed a pedestrian survey and co-authored the subsequent paleontological resources assessment used to update regulations for future development within the Northside area of the LAX Specific Plan. 2012.

Westside Exploratory Test Shaft. Paleontology Technician. Provided paleontological monitoring during drilling of test shafts for a subway project located in the La Brea Zone. Used a Trimble unit to map tar seeps within a 1 mile radius of the project area. 2012-present.

Rancho Malibu Hotel Project. Paleontology Technician. Conducted a pedestrian survey and co-authored the subsequent paleontological assessment report for a 28 acre hotel construction project in Malibu. 2012.

Geospatial Paleontology Database, Caltrans District 6, 9, and 10. Paleontology Researcher. Conducted paleontological research for 15 counties in central and eastern California. Delivered detailed information about potential fossil yield, geological units, prior fossils and other information at cursor click. 2011-2012.

State Route 91 Project, Caltrans District 8. Paleontology Technician. Performed paleontological monitoring of sensitive sediments during HOV lane construction along a 6 mile segment of SR-91 in Riverside County. 2011-2012.

East San Fernando Valley Transit Corridor. Paleontology Technician. Conducted a paleontological survey and co-authored paleontological assessment and existing condition reports for a Metro project located in the cities of Los Angeles and San Fernando. 2011-present.

Jackson Valley Road Widening Project, Caltrans District 10. Paleontology Technician. Performed paleontological monitoring of sensitive sediments during road widening in near Ione, CA. 2011-present.

JAY A. SCHNEIDER, PH.D., P.G.

California Professional Geologist

EDUCATION

1993 Ph.D., Geophysical Sciences, University of Chicago
1988 M.S., Geology, University of Cincinnati
1985 B.A., Earth and Planetary Sciences, The Johns Hopkins University

SUMMARY QUALIFICATIONS

Dr. Schneider is a California Professional Geologist (#8787) with 18 years of experience in paleontology and an additional six years of experience in environmental geology. He conducts fieldwork, prepares technical reports and co-authors Paleontological Mitigation Plans. Dr. Schneider has authored sixteen scholarly papers on the systematics, evolution, and paleoecology of mollusks and echinoderms, including an invited review article for the 75th anniversary issue of Journal of Paleontology. He has conducted research all over the world, including the western United States, Guam, Australia, Philippines, Jamaica, Bahamas, Florida, and also Panama as a postdoctoral fellow of the Smithsonian Tropical Research Institute.

SELECTED PROJECTS

SR 99 Widening, Caltrans District 6 On-Call, South Stockton, CA. Paleontological Mitigation Plan, involves widening SR 99 from four-lanes to six lanes and improvements to multiple interchanges in the South Stockton area. Subcontractor to URS Corporation. Principal Paleontologist. 2012

U.S. 101 Express Lanes Project, Caltrans District 4, Santa Clara County, CA. Principal Paleontologist. The 37-mile linear project entails freeway widening and HOV lane conversion along US 101 and SR 85 (North). Prepared a Paleontological Evaluation Report and Mitigation Plan. Cogstone also addressed archaeological resources in an Archaeological Survey Report (ASR) under CEQA and Section 106 of the NHPA . Subcontractor to URS Corporation. 2012

SR 41 Widening, Caltrans District 6 On-Call, Kettleman City, CA Principal Investigator for Paleontology. Co-author of the Paleontological Mitigation Plan. Completed revisions requested by the client. This task order project involves widening and rehabilitating Highway 41 from Utica Avenue to Quail Avenue through Kettleman City. Subcontractor to URS Corporation. 2012

California High-Speed Rail, Paleontological Assessments, Bakersfield to Palmdale, CA. Principal Paleontologist/Project Manager. Preparing revisions to the Combined Paleontological Identification Report/Paleontological Evaluation Report (Cogstone 2010) which included the background research, results of the survey, and recommendations for mitigation. The Project Study Area included direct impact areas as well as staging areas and temporary road construction areas, mostly along existing rail corridors. Subcontractor to URS Corporation. 2012-2013

Southern California Edison On-Call Paleontological Services, Alpine Interconnection Project. Principal Paleontologist. Author of the final Paleontological Resources Monitoring Compliance Report. This task order involved the replacement of three poles that failed wind loading. SCE is installing the interconnection of the 66 MW Alpine Solar Project to the Neenach Substation via a generation tie-line and 16.7 miles of telecommunications fiber optic cables. 2012

Pacific Gas & Electric Atascadero – SLO 70 kV Reconductor. Project Manager and QSP. Managed budget and determined inspection schedule for 16.3-mile PG&E LUP from Atascadero substation to San Luis Obispo substation. Conducted majority of inspections at site and supervised additional inspectors. Determined if construction at site adhered to SWPPP regulations. Confirmed status of BMPs and recommended repairs and modifications to SWPPPs. Prepared SWPPP amendments and Annual Report. 2011-2012

MOLLY VALASIK, RPA
Qualified Archaeologist/ Cross-Trained Paleontologist
GIS Specialist

EDUCATION

2009	M.A., Anthropology, Kent State University, Kent, Ohio
2006	B.A., Anthropology, Ohio State University, Columbus, Ohio

SUMMARY QUALIFICATIONS

Ms. Valasik is a qualified archaeologist with both professional and academic archaeological field and research experience. She is GIS proficient including the use of Trimble GeoXH technology and advanced Trimble software. Ms. Valasik has more than six years of experience in California and works as a supervisor for fieldwork, site records and report writing. She has completed more than 32 hours of paleontological training.

SELECTED PROJECTS

Kings River Bridge, Tulare, CA. Caltrans District 6. Performed paleontological record searches and background research. Cogstone prepared a Paleontological Mitigation Plan to Caltrans requirements, conducted sensitivity training for personnel, provided on-call monitoring and submitted a Paleontological Mitigation Report to the Tulare County Resource Management Agency. Prepared GIS maps for the Paleontological Mitigation Plan for this 2.8 acre bridge construction project. GIS Specialist. 2012

Interstate-15, Cenda Ditch Bridge and Wheaton Wash Bridge Replacement. FHWA/BLM/Caltrans District 8. Prepared GIS maps for the combined Paleontological Evaluation Report and Paleontological Identification Report for the Project Study Area located on 15.5 acres along westbound Interstate-15 in eastern San Bernardino County. GIS Specialist. 2011

Caltrans District 7 On-Call. Participated in two task orders under subcontract to Galvin Preservation Associates for the LOSSAN North Rail Improvements Project, Ventura County Segment (Caltrans Division of Rail and the Federal Railroad Administration). Conducted archaeological record search, digitized cultural site locations in GIS, georeferenced 8 geologic maps, and created paleontology sensitivity maps based on the Potential Fossil Yield Classification (PFYC) scale. Archaeology/Paleontology Field Technician/GIS Specialist. 2011

California High Speed Rail, Bakersfield to Palmdale Segment. Performed pedestrian survey of roughly 59 miles, recorded survey area with Trimble GeoXH, produced weekly updates, and geo-referenced Dibblee maps (geology formations). Paleontology Field Technician/GIS Specialist. 2009-ongoing

State Route 178 Widening, Kern County. Caltrans District 6. Performed four-day intensive archaeological and paleontological survey of the 8-mile project area and associated GIS mapping. Relocated previously recorded lithic scatter and determined the site to be destroyed by construction activities. Archaeology/Paleontology Field Technician/GIS Specialist. 2008-2012

U.S. Highway 101 Express Lanes Project. FHWA/Caltrans District 4/Santa Clara Valley Transportation Authority, Santa Clara, CA. The 38-mile linear project entails freeway widening and HOV lane conversion along US 101 and SR 85. Cogstone surveyed the 1,911-acre APE, prepared an Archaeological Survey Report (ASR) under CEQA and NHPA Section 106 and prepared a Paleontological Evaluation Report and Mitigation Plan (PERMP). A for PERMP.2012-2013.

Date Palm Drive/Whitewater River Bridge Widening. Caltrans District 8, Cathedral City, Riverside County, CA. The project involved literature and Sacred Lands searches, survey, and technical report sor widening of Whitewater River bridge (Historic Property Survey Report [HPSR] and Archaeological Survey Report [ASR]). Portion of APE on Agua Caliente Indian Reservation land; Narrative HPSR, Section 106 compliance, and consultation with Tribal

Historic Preservation Officer (THPO) in lieu of SHPO. As GIS Specialist, prepared GIS maps for approximately 20 acres. 2012-2013

APPENDIX B. RECORDS SEARCHES

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

NATURAL HISTORY MUSEUM
LOS ANGELES COUNTY

Vertebrate Paleontology Section
Telephone: (213) 763-3325
Fax: (213) 746-7431
e-mail: smcleod@nhm.org

5 August 2013

Cogstone Resource Management, Inc.
1518 Taft Avenue
Orange, CA 92865-4157

Attn: Sherri Gust

re: Vertebrate Paleontology Records Check for paleontological resources for the proposed Olancha / Cartago 4 Lane Project, Cogstone Project # 2398-003, in Owens Valley, Inyo County, project area

Dear Sherri:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed Olancha / Cartago 4 Lane Project, Cogstone Project # 2398-003, in Owens Valley, Inyo County, project area as outlined on the portions of the Bartlett, Olancha, Vermillion Canyon, Haiwee Pass, and Haiwee Reservoirs USGS topographic quadrangle maps that Molly Valasik sent to me via e-mail on 12 July 2013. We do not have any vertebrate fossil localities that lie directly within the proposed project area boundaries, but we do have localities nearby from the same sedimentary deposits that occur in the proposed project area and from other deposits that may occur at depth in the proposed project area..

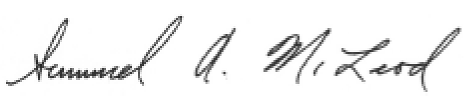
The entire proposed project area has surficial deposits composed of younger Quaternary Alluvium, derived predominantly as alluvial fan deposits from the Sierra Nevada Mountains immediately to the west. Along the drainages, including Braley Creek and Cartego Creek in the north, Olancha Creek, and Summit Creek in the south, fluvial deposits compose the surficial younger Quaternary Alluvium. Our closest vertebrate fossil locality from these deposits is LACM 4538, near the mouth of Summit Creek and current dam for the North Haiwee Reservoir, that produced a specimen of the Columbian mammoth, *Mammuthus columbi*, collected by William Mulholland during construction of the Los Angeles aqueduct. Our next closest vertebrate fossil locality from these deposits is LACM 4691, just east of north of the proposed project area south of the Owens River just south of where State Highway 136 crosses the Owens River, that produced probosicdean remains and a fossil specimen of mountain lion, *Felis concolor*. Along the northeastern shore of the current Owens Lake, near Swansea, we have the fossil vertebrate localities LACM 7716-7719 that produced fossil specimens of bony fish, Teleostei, bird, Aves, jack rabbit, *Lepus*, pocket gopher, *Thomomys*, and even-toed ungulate, Artiodactyla. Two of these localities, LACM 7717-7718, came from lacustrine deposits of the formerly expanded Owens Lake at depths of 2-3 feet below the current surface.

Around the margins of the North Haiwee Reservoir near the southern terminus of the proposed project area, there are exposures of the Pliocene Coso Formation. These deposits may possibly occur at depth in the very southern end of the proposed project area. We have a number of vertebrate fossil localities in the Coso Formation, LACM (CIT) 131, 284-285, LACM 1106, 1182, 3515, 4102, and 4591-4600, all east of the proposed project area on the northern flank of the Coso Mountains southeast of Highway 190. Our Coso Formation localities produced a suite of fossil birds and mammals (see appendix for faunal list) and some of these taxa were published in the scientific literature (see appendix for scientific articles citing our Coso Formation specimens), including the holotypes (the single name-bearing specimens for species new to science) of the mastodon *Pliomastodon cosoensis*, the field mouse *Cosomys primus* (now known as *Mimomys primus*), and the bone-crushing dog *Hyaenognathus solus* (now know as *Borophagus diversidens*),

Very shallow excavations in the Quaternary alluvial fan deposits throughout the proposed project area may not uncover significant fossil vertebrate remains. Deeper excavations throughout the proposed project area, however, may well encounter significant vertebrate fossils. Any substantial excavations in the proposed project area, therefore, should be closely monitored to quickly and professionally recover any fossil remains while not impeding development. Any fossils collected should be placed in an accredited scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,



Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosures: appendices, invoice

Taxa from Coso Formation localities
based on specimens in the LACM collections

Osteichthyes			
Cypriniformes			
Cyprinidae			
Gila		- chub	
Aves			
Accipitriformes			
Accipitridae			
Aquilinae		- eagle	
Gaviiformes			
Gaviidae			
Gavia		- loon	
Pelecaniformes			
Pelecanidae			
Pelecanus		- pelican	
Pelecaniformes			
Phalacrocoracidae			
Phalacrocorax		- cormorant	
Mammalia			
Artiodactyla			
Camelidae		- camels	
Camelops			
Hemiauchenia			
Tanupolama			Figured
Tayassuidae			
Platygonus		- peccary	Figured
Carnivora			
Canidae		- dogs	
Borophagus	*diversidens*		HOLOTYPE
Borophagus	*solus*		Published
Epicyon	*saevus*		Published
Lagomorpha			
Leporidae		- rabbits	
Hypolagus	*limnetus*		Published
Pewelagus	*dawsonae*		Figured
Perissodactyla			
Equidae			
Plesippus	*francescana*	- horse	Figured
Proboscidea			
Elephantidae			
Mammuthus	*meridionalis*	- mammoth	
Mammutidae			
Pliomastodon	*cosoensis*	- mastodon	HOLOTYPE
Rodentia			
Cricetidae		- deer mice & wood rats	
Cosomys	*primus*		HOLOTYPE
Paraneotoma	*taylori*		
Paraneotoma	*vaughani*		

Scientific Publications Citing LACM Specimens from the Coso Formation

Colbert, Edwin H. 1938. Pliocene peccaries from the Pacific Coast region of North America. Carnegie Institution of Washington Publication, 487(6):241-269.

Schultz, John R. 1936. *Plesippus francescana* (Frick) from the late Pliocene Coso Mountains, California, with a review of the genus *Plesippus*. Carnegie Institution of Washington Publication, 473(1):1-13.

Schultz, John R. 1937. A late Cenozoic vertebrate fauna from the Coso Mountains, Inyo County, California. Carnegie Institution of Washington Publication, 487(3):75-109.

Stock, Chester. 1932. *Hyaenognathus* from the Late Pliocene of the Coso Mountains, California. Journal of Mammalogy, 13(3):263-266.

Wang, Xiaoming, Richard H. Tedford and Beryl E. Taylor. 1999. Phylogenetic Systematics of the Borophaginae (Carnivora: Canidae). Bulletin of the American Museum of Natural History, 243:1-391.

White, John A. 1988. The Archaeolaginae (Mammalia, Lagomorpha) of North America, excluding *Archaeolagus* and *Panolax*. Journal of Vertebrate Paleontology, 7(4):425-450.

Wilson, Robert W. 1932. *Cosomys*, a new genus of vole from the Pliocene of California. Journal of Mammalogy, 13(2):150-155.

Wilson, Robert W. 1933. A rodent fauna from Later Cenozoic beds of southwestern Idaho. Carnegie Institution of Washington Publication, 440(8):117-135.

UCMP Record Search

Re: Record seach for US 395 near Olancha, CA
Dear Kim,

I have conducted a search for previous fossil finds in the UCMP databases for the Olancha project area. I do not think there are any prior finds from the project area.

However, I did find one locality that appears to have been misplotted there: UCMP locality V67136, represented by a single ?*Pliohippus* metapodial (UCMP 67528). The only locality data for it is "Green Velvet #3 Uranium Claim, Olancha, California". At some point in the 1970's, it was plotted as being in Section 13, just west of the town of Olancha. Luckily, we can now just Google such things, and I found that the Green Velvet uranium claims are all approximately 3.5 miles EAST of Olancha, up in the hills with all the other uranium claims. Therefore, I think the original location was a mistake and should not be used to indicate that one is likely to find a *Pliohippus* in your project corridor.

Cheers, Pat

Patricia A. Holroyd, Ph.D.
Museum of Paleontology
1101 Valley Life Sciences Building
University of California, Berkeley, CA 94720
pholroyd@berkeley.edu

SAN BERNARDINO COUNTY MUSEUM

2024 Orange Tree Lane • Redlands, California USA 92374-4560
(909) 307-2669 • Fax (909) 307-0539 • www.sbcountymuseum.org

COUNTY OF SAN BERNARDINO
ECONOMIC DEVELOPMENT
AND PUBLIC SERVICES GROUP

ROBERT L. McKERNAN
Director

30 August 2002

Cogstone Resource Management
attn: Sherri Gust
1801 Parkcourt Place D200
Santa Ana, CA 92701

re: **LITERATURE / RECORDS REVIEW, OUTER MARGIN OF OWENS LAKE, INYO COUNTY, CALIFORNIA**

Dear Sherri,

The Division of Geological Sciences of the San Bernardino County Museum (SBCM) has completed a literature review and records search for the above-named study area. The outer margin of Owens Lake crosses portions of the following United States Geological Survey topographic quadrangle maps: Bartlett, CA (1987 provisional edition); Cerro Gordo Peak, CA (1987 provisional edition); Dolomite, CA (1987 provisional edition); Keeler, CA (1987 provisional edition); Lone Pine, CA (1982 edition); Olancha, CA (1988 provisional edition); and Vermillion Canyon, CA (1987 provisional edition).

Previous geologic mapping (Streitz and Stinson, 1974) indicates that the surface geology of the study area consists primarily of Quaternary alluvium overlying Quaternary lake sediments; some dune sands are also present in the eastern portion of the property. The Quaternary alluvium has undetermined paleontologic sensitivity, depending upon when its lithology and the timing of its deposition; much of this alluvium is likely derived from higher stands of Owens Lake during the Pleistocene Epoch, however, and can therefore be presumed to have high paleontologic sensitivity. The underlying Quaternary lake sediments also have high paleontologic sensitivity (Hay, 1927; Jefferson 1989, 1991). To the south of Owens Lake, exposures of the Coso Formation are also highly fossiliferous, although these exposures are not mapped as present within the proposed study area.

A review of the Regional Paleontologic Locality Inventory (RPLI) at the SBCM was conducted by the staff of the Division of Geological Sciences, SBCM. The results of this review indicated that no previously-recorded paleontologic resource localities are present within the proposed study area. However, two paleontologic resource localities, SBCM 6.6.3 - 6.6.4, are located ~1 mile northeast of the northern extent of Owens Lake. These localities have yielded fossil remains of extinct horse (*Equus*), camel (*Camelops*) and bison (*Bison*) from sediments mapped (Streitz and Stinson, 1974) as Quaternary alluvium. Additionally, Hay (1927) reported a record of mammoth (*Mammuthus* sp. cf. *M. columbi*) from the Lone Pine region north of Owens Lake. Finally, Jefferson (1989, 1991) reported fossil remains of medium-sized felid (Felidae), mammoth or mastodon (Proboscidea), horse

(*Equus*) and camel (Camelidae) from the "Lone Pine Southeast" locality near northern Owens Lake. The proximity of these localities to Owens Lake demonstrates the high paleontologic sensitivity of Quaternary alluvium and Quaternary lake sediments in this area.

Recommendations

The results of the literature review and the check of the RPLI at the SBCM demonstrate that the boundaries of the proposed California City Annexation and Redevelopment project in California City encompass geologic formations having high paleontologic sensitivity. These units include surficial and subsurface Pleistocene older alluvium, Pleistocene lake sediments, and Miocene rocks of the Tropico Group. Excavation into any of these units has high potential to adversely impact significant nonrenewable paleontologic resources. All of these rock units therefore have high paleontologic sensitivity. In the event of excavation or other disturbance in these rock units, a qualified vertebrate paleontologist must be retained to develop a program to mitigate impacts to nonrenewable paleontologic resources. This mitigation program would need to be consistent with the provisions of the California Environmental Quality Act, as well as with the proposed guidelines of the Society of Vertebrate Paleontology. This program should include, but not be limited to:

1. Monitoring of excavation in areas identified as likely to contain paleontologic resources by a qualified paleontologic monitor. Based upon the results of this review, areas of concern include any and all undisturbed Quaternary alluvium and/or Quaternary lake sediments present at the surface or in the subsurface. Any fossils washed down from exposures of the Coso Formation into the study area may also be significant if their origin can be reliably retraced. Monitoring in these units should be conducted on a full-time basis. Paleontologic monitors should be equipped to salvage fossils as they are unearthed to avoid construction delays, and to remove samples of sediments which are likely to contain the remains of small fossil invertebrates and vertebrates. Monitors must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Monitoring may be reduced if the potentially-fossiliferous units described herein are not present, or if present are determined upon exposure and examination by qualified paleontologic personnel to have low potential to contain fossil resources.

2. Preparation of recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates.

3. Identification and curation of specimens into a professional, accredited museum repository with permanent retrievable storage. The paleontologist should have a written repository agreement in hand prior to the initiation of mitigation activities.

4. Preparation of a report of findings with an appended itemized inventory of specimens. The report and inventory, when submitted to the appropriate Lead Agency, would signify completion of the program to mitigate impacts to paleontologic resources.

References

Hay, O.P., 1927. The Pleistocene of the western region of North America and its vertebrate animals. Carnegie Institute of Washington Publication 322(B): 1-346.

Jefferson, G.T., 1989. Late Pleistocene and earliest Holocene fossil localities and vertebrate taxa from the western Mojave Desert. *In* J. Reynolds (ed.), The west-central Mojave Desert: Quaternary studies between Kramer and Afton Canyon. Redlands: SBCM Association Special Publication, p. 27-40.

Jefferson, G.T., 1991. A catalogue of late Quaternary vertebrates from California: Part Two, mammals. Natural History Museum of Los Angeles County Technical Reports, No. 7.

Streitz, R. and M.C. Stinson, 1974. Geologic map of California, Death Valley sheet. California Division of Mines and Geology, scale 1:250,000.

Please do not hesitate to contact us with any further questions you may have.

Sincerely,

Eric Scott, Curator of Paleontology
Division of Geological Sciences
San Bernardino County Museum

APPENDIX C. SENSITIVITY RANKING CRITERIA

Caltrans Rank	Caltrans Description	PFYC Description	PFYC Rank
No	Rock units of intrusive igneous origin, most extrusive igneous rocks, and moderately to highly metamorphosed rocks are classified as having no potential for containing significant paleontological resources	Very Low. The occurrence of significant fossils is non-existent or extremely rare. Includes igneous or metamorphic and Precambrian or older rocks. Assessment or mitigation of paleontological resources is usually unnecessary.	1
Low	This category includes sedimentary rock units that: 1) are potentially fossiliferous, but have not yielded significant fossils in the past; 2) have not yet yielded fossils, but possess a potential for containing fossil remains; or 3) contain common and/or widespread invertebrate fossils if the taxonomy, phylogeny, and ecology of the species contained in the rock are well understood.	Low. Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils. Includes rock units too young to produce fossils, sediments with significant physical and chemical changes (e.g., diagenetic alteration) and having few to no fossils known. Assessment or mitigation of paleontological resources is not likely to be necessary.	2
		Potentially Moderate but Undemonstrated Potential. Units exhibit geologic features and preservational conditions that suggest fossils could be present, but no vertebrate fossils or only common types of plant and invertebrate fossils are known. Surface-disturbing activities may require field assessment to determine appropriate course of action.	3b
High	Rock units which, based on previous studies, contain or are likely to contain significant vertebrate, significant invertebrate, or significant plant fossils	Moderate Potential. Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered and of low abundance. Common invertebrate or plant fossils may be found. Surface-disturbing activities may require field assessment to determine appropriate course of action.	3a
		High. Geologic units containing a high occurrence of significant fossils. Fossils must be abundant per locality. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. If impacts to significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action will usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.	4
		Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. Vertebrate fossils or scientifically significant invertebrate fossils are known or can reasonably be expected to occur in the impacted area. On-the-ground surveys prior to authorizing any surface disturbing activities will usually be necessary. On-site monitoring may be necessary during construction activities.	5

Traffic Operations Reports

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

M e m o r a n d u m

Flex your power!
Be energy efficient!

To: **RON CHEGWIDDEN**
Design J

Date: January 20, 2010

File: 09-213400
INY-395-PM 29.2/41.80
Olancha Cartago 4 Lane

From: **DONNA HOLLAND**
Traffic Operations

Subject: Traffic Index (TI) Calculations and Design Designation

Attached you will find the Traffic Index (TI) Calculations and Design Designation for the Olancha Cartago 4 Lane project on US 395 between PM's 29.20 and 41.80. This report updates any previous report you have received.

Data Year…………………………………2008 AADT = 5600
Completed Construction Year AADT….. 2017 AADT = 6290
5 Year AADT…………….…………………2022 AADT = 6710
10 Year AADT………………………… 2027 AADT = 7160
20 Year AADT………………………… 2037 AADT = 8140
5 Year TI……………..……………………2022 TI = 10.0
10 Year TI…………..……………………2027 TI = 10.5
20 Year TI…………..……………………2037 TI = 12.0
Construction Year DHV……………..….… 2017 DHV = 1160
5 Year DHV……………..………………2022 DHV = 1240
10 Year DHV……………..……………… 2027 DHV = 1330
20 Year DHV……………..……………… 2037 DHV = 1510
2008 Directional Split = 73.59 %
2008 Trucks = 21.5 %

If you have any questions, please do not hesitate to call me. I may be reached at (760) 872-0711 or CALNET 8-627-0711.

Attachment

c: File

TRAFFIC INDEX and DESIGN DESIGNATION
CALCULATION SHEET

CO-RTE-PM INY-395-PM 29.2/41.80
EA 09-213400
JOB NAME Olancha Cartago 4 Lane

Requested by: Ron Chegwidden
Unit: Design J
Date: 01/20/10

Census Year 2008
Construction Year 2017
Complete Construction Year 2017
2 Way AADT 5,600
Lane Distribution Factor 1.0 (Table 602.3B, Highway Design Manual)

	AM Peak	PM Peak
Peak Hour Percent, K	14.54	18.52
Directional Split, D	73.59	69.53
Product of K and D, KD	10.70	12.88
DHV = AADT x K /100	814	1037

PERCENT TRUCKS (%) 21.5
1 WAY TRUCK VOLUME 886
GROWTH FACTOR, %/Year 1.3

-------------------TRAFFIC INDEX CALCULATIONS-------------------

Traffic Index Calculations are based on completion of construction per HDM 103.2

FIVE YEAR TRAFFIC INDEX

Vehicle Type	Trucks (%)	Present ADT One Way	Expansion Factor	Expanded ADT One Way	5 Year Constant	Lane Factor	ESALs
2 axle	30.65	272.0	1.1601	316.0	345	1	109,020
3 axle	9.44	84.0	1.1601	97.0	920	1	89,240
4 axle	7.77	69.0	1.1601	80.0	1470	1	117,600
5 axle	52.14	462.0	1.1601	536.0	3445	1	1,846,520
TOTALS	100	887.0		1029.0			2,162,380

Five Year TI **10.0**

TEN YEAR TRAFFIC INDEX

Vehicle Type	Trucks (%)	Present ADT One Way	Expansion Factor	Expanded ADT One Way	10 Year Constant	Lane Factor	ESALs
2 axle	30.65	272.0	1.1982	326.0	690	1	224,940
3 axle	9.44	84.0	1.1982	101.0	1840	1	185,840
4 axle	7.77	69.0	1.1982	83.0	2940	1	244,020
5 axle	52.14	462.0	1.1982	554.0	6890	1	3,817,060
TOTALS	100	887.0		1064.0			4,471,860

Ten Year TI **10.5**

TWENTY YEAR TRAFFIC INDEX

Vehicle Type	Trucks (%)	Present ADT One Way	Expansion Factor	Expanded ADT One Way	20 Year Constant	Lane Factor	ESALs
2 axle	30.65	272.0	1.2781	348.0	1380	1	480,240
3 axle	9.44	84.0	1.2781	107.0	3680	1	393,760
4 axle	7.77	69.0	1.2781	88.0	5880	1	517,440
5 axle	52.14	462.0	1.2781	591.0	13780	1	8,143,980
TOTALS	100	887.0		1134.0			9,535,420

Twenty Yr TI **12.0**

SHOULDER TIs

Design Life	2% ESALs	TI
5 Year	43,248	**6.0**
10 Year	89,437	**6.5**
20 Year	190,708	**7.5**

-------------------DESIGN DESIGNATION-------------------

Design Designation is based on year of construction per HDM 103.1

Construction Year AADT………………………………………….. AADT (2017) = 6290
Five Year AADT……………………………………………………. AADT (2022) = 6710
Ten Year AADT……………………………………………………. AADT (2027) = 7160
Twenty Year AADT………………………………………………. AADT (2037) = 8140
Construction Year DHV………………………………………….. DHV (2017) = 1160
Five Year DHV……………………………………………………. DHV (2022) = 1240
Ten Year DHV……………………………………………………. DHV (2027) = 1330
Twenty Year DHV………………………………………………. DHV (2037) = 1510
D = 73.59 %
T = 21.5 %

TRAFFIC OPERATIONS

January 20, 2010
DATE

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

M e m o r a n d u m

Flex your power!
Be energy efficient!

To: **RON CHEGWIDDEN**
Design Engineer, Design J

Date: December 24, 2013

File: 09-213400
INY-395-PM 29.2/41.80
Olancha Cartago 4 Lane

From: **DONNA HOLLAND**
Traffic Operations

Subject: **TRAFFIC INDEX (TI) CALCULATIONS AND DESIGN DESIGNATION**

Attached you will find updated Traffic Index (TI) Calculations and Design Designation for the Olancha Cartago 4 Lane project on US 395 between PM's 29.20 and 41.80. This report updates any previous report you have received. Also attached is the accident analysis for the 395 portion of the roadway.

Data Year………………………………… 2012 AADT = 5300
Completed Construction Year AADT….. 2019 AADT = 5490
5 Year AADT……………..…………… 2024 AADT = 5630
10 Year AADT………………………… 2029 AADT = 5770
20 Year AADT………………………… 2039 AADT = 6060
5 Year TI……………..………………… 2024 TI = 9.5
10 Year TI……………..……………… 2029 TI = 10.5
20 Year TI……………..……………… 2039 TI = 11.5
Construction Year DHV…………..…… 2019 DHV = 1020
5 Year DHV……………..……………… 2024 DHV = 1040
10 Year DHV……………..…………… 2029 DHV = 1070
20 Year DHV……………..…………… 2039 DHV = 1120
2012 Directional Split = 77.49 %
2012 Trucks = 20.3 %

If you have any questions, please do not hesitate to call me. I may be reached at (760) 872-0711 or CALNET 8-627-0711.

Attachments
(1) Calculations
(2) Accident Analysis

Donna Holland / dh

TRAFFIC INDEX and DESIGN DESIGNATION
CALCULATION SHEET

CO-RTE-PM INY-395-PM 29.2/41.80
EA 09-213400
JOB NAME Olancha Cartago 4 Lane

Requested by: Ron Chegwidden
Unit: Design Engineer, Design J
Date: 12/24/13

Census Year 2012
Construction Year 2017
Complete Construction Year 2019
2 Way AADT 5,300
Lane Distribution Factor 1.0 (Table 602.3B, Highway Design Manual)

	AM Peak	PM Peak
Peak Hour Percent, K	13.07	18.53
Directional Split, D	77.49	70.09
Product of K and D, KD	10.13	12.99
DHV = AADT x K /100	693	982

PERCENT TRUCKS (%) 20.3
1 WAY TRUCK VOLUME 834
GROWTH FACTOR, %/Year 0.5

-------------------TRAFFIC INDEX CALCULATIONS-------------------

Traffic Index Calculations are based on completion of construction per HDM 103.2

FIVE YEAR TRAFFIC INDEX

Vehicle Type	Trucks (%)	Present ADT One Way	Expansion Factor	Expanded ADT One Way	5 Year Constant	Lane Factor	ESALs
2 axle	24.68	206.0	1.0485	216.0	345	1	74,520
3 axle	17.51	146.0	1.0485	153.0	920	1	140,760
4 axle	14.8	123.0	1.0485	129.0	1470	1	189,630
5 axle	43.01	359.0	1.0485	376.0	3445	1	1,295,320
TOTALS	100	834.0		874.0			1,700,230

Five Year TI **9.5**

TEN YEAR TRAFFIC INDEX

Vehicle Type	Trucks (%)	Present ADT One Way	Expansion Factor	Expanded ADT One Way	10 Year Constant	Lane Factor	ESALs
2 axle	24.68	206.0	1.0617	219.0	690	1	151,110
3 axle	17.51	146.0	1.0617	155.0	1840	1	285,200
4 axle	14.8	123.0	1.0617	131.0	2940	1	385,140
5 axle	43.01	359.0	1.0617	381.0	6890	1	2,625,090
TOTALS	100	834.0		886.0			3,446,540

Ten Year TI **10.5**

TWENTY YEAR TRAFFIC INDEX

Vehicle Type	Trucks (%)	Present ADT One Way	Expansion Factor	Expanded ADT One Way	20 Year Constant	Lane Factor	ESALs
2 axle	24.68	206.0	1.0885	224.0	1380	1	309,120
3 axle	17.51	146.0	1.0885	159.0	3680	1	585,120
4 axle	14.8	123.0	1.0885	134.0	5880	1	787,920
5 axle	43.01	359.0	1.0885	391.0	13780	1	5,387,980
TOTALS	100	834.0		908.0			7,070,140

Twenty Yr TI **11.5**

SHOULDER TIs

Design Life	2% ESALs	TI
5 Year	34,005	**6.0**
10 Year	68,931	**6.5**
20 Year	141,403	**7.0**

-------------------DESIGN DESIGNATION-------------------

Design Designation is based on year of construction per HDM 103.1

Construction Year AADT………………………………………….. **AADT (2019) = 5490**
Five Year AADT…………………………………………………….. **AADT (2024) = 5630**
Ten Year AADT……………………………………………………… **AADT (2029) = 5770**
Twenty Year AADT………………………………………………… **AADT (2039) = 6060**
Construction Year DHV………………………………………….. **DHV (2019) = 1020**
Five Year DHV…………………………………………………….. **DHV (2024) = 1040**
Ten Year DHV…………………………………………………….. **DHV (2029) = 1070**
Twenty Year DHV………………………………………………… **DHV (2039) = 1120**
D = 77.49 %
T = 20.3 %

TRAFFIC OPERATIONS

December 24, 2013
DATE

09-213401 Traffic Data Report

December 24, 2013

Project: **Olancha/Cartago 4 Lane, Inyo 395 PM 29.2/41.8, 09-213400, 0900000030**

Speed Zone Survey: The project limits encompass three speed zones with the following posted speed limits and locations.

Posted Speed	Inyo 395 Post Miles
65 MPH	Project Begin at 29.2 To PM 33.8
55 MPH	PM 33.8 To PM 37.9
65 MPH	PM 37.9 To end of project PM 41.8

Accident Data:

10 year Table B – 01/01/2002 to 12/31/2011

Accident Rates expressed in Million Vehicle Miles (MVM).

Accident Rates (Per MVM)*		
Types	Actual Avg.	Statewide Avg.
Fatal	0.029	0.017
F + I*	0.23	0.29
Total	0.48	0.67
* Accidents per Million Vehicle Miles		
* Fatal plus Injury		

Summary: Within the project limits there were 130 reported collisions during the ten year time frame of 01/01/2002-12/31/2011. There were eleven fatalities in eight fatal collisions and 123 people injured in 55 injury collisions.

Accident Statistics:

80.0% (104) occurred when the weather was clear.
58.5% (76) occurred during hours of daylight.
88.5% (115) occurred when the pavement was dry.

59.2% (77) were single vehicle collisions.
31.6% (41) were two vehicle collisions.
9.2% (12) were three or more vehicle collisions.

6.2% (8) Fatal Collisions.
42.3% (55) Injury Only Collisions
51.5% (67) Property Damage Only Collisions

62.3% (81) Northbound.

Type of Collision:

33.8% (44) Overturn
26.9% (35) Hit Object
13.8% (18) Sideswipe
10.0% (13) Rear End
6.2% (8) Broadside
4.6% (6) Head-On
4.6% (6) Other

Primary Collision Factor:

23.1% (30) Speeding
30.0% (39) Improper Turn
17.7% (23) Other Violations
15.4% (20) Other Than Driver
6.2% (8) DUI
6.9% (9) Failure To Yield
0.8% (1) Unknown

Vehicle Type:

60.8% (79) Passenger Car
28.4% (37) Semi Trucks
25.4% (33) Pickup Trucks
6.2% (8) Pickup w/Trailer
7.7% (10) Livestock
3.1% (4) Motorcycle
3.1% (4) Spilled Loads
1.5% (2) Disengaged Tow
3.8% (5) Passenger Car w/Trailer
2.3% (3) Other Motor Vehicle
1.5% (2) Other Animal

Highway Group

83.8% (109) Undivided
16.2% (21) Divided

Collision Year

2002	12.3%	(16)
2003	9.2%	(12)
2004	16.2%	(21)
2005	10.0%	(13)
2006	13.8%	(18)
2007	10.0%	(13)
2008	9.2%	(12)
2009	4.6%	(6)
2010	7.7%	(10)
2011	6.9%	(9)

Recently Completed Projects within Project Post Miles

1. The Olancha/Cartago Shoulder Widening Project was completed by November 1, 2006 (09-319704, INY-395-PM 31.1/41.4). This project also installed the Pass/No Passing Pennant Signs.
2. The radar feedback interactive signs were installed by June 23, 2005 (09A0261, INY-395-PM 31.8/40.75).

Compiled by: Donna Holland – Traffic Operations and Safety.