

INFORMATION HANDOUT

WATER QUALITY

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

PERMITS

STATE OF CALIFORNIA DEPARTMENT OF FISH AND GAME

UNITED STATES ARMY CORPS OF ENGINEERS
NON-REPORTING NATIONWIDE 404 PERMIT

AGREEMENTS

UNITED STATES FISH AND WILDLIFE SERVICE (Biological Opinion)

MATERIALS INFORMATION

FOUNDATION REPORTS

HYDRAULIC REPORT

NOMINAL CAPACITY EVALUATION OF EXISTING PILES

OSHA UNDERGROUND CLASSIFICATION



Linda S Adams
Secretary for
Environmental
Protection

California Regional Water Quality Control Board Central Valley Region

Karl E. Longley, ScD, P.E., Chair

1685 E Street, Fresno, California 93706
(559) 445-5116 • Fax (559) 445-5910
<http://www.waterboards.ca.gov/centralvalley>



Arnold
Schwarzenegger
Governor

17 June 2009

Charles Walbridge, Project Biologist
California Department of Transportation
2015 E. Shields Avenue, Suite 100
Fresno, CA 93726

ACTION ON REQUEST FOR CLEAN WATER ACT SECTION 401 WATER QUALITY CERTIFICATION FOR DISCHARGE OF DREDGED AND/OR FILL MATERIALS ASSOCIATED WITH THE GOSHEN TO KINGSBURG SIX-LANE PROJECT, FRESNO AND TULARE COUNTIES

APPLICANT: California Department of Transportation

PROJECT: Refer to Attachment 1 for Project Information

ACTION:

1. Order for Standard Certification
2. Order for Technically-conditioned Certification
3. Order for Denial of Certification

WATER QUALITY CERTIFICATION STANDARD CONDITIONS:

1. This certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Section 13330 of the California Water Code and Section 3867 of Title 23 of the California Code of Regulations (23 CCR).
2. This certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to 23 CCR subsection 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
3. The validity of any non-denial certification action is conditional upon total payment of the full fee required under 23 CCR Section 3833, unless otherwise stated in writing by the certifying agency

4. Certification is valid for the duration of the described project. The California Department of Transportation shall notify the Central Valley Regional Water Quality Control Board (Central Valley Water Board) in writing within 7 days of project completion.

TECHNICAL CONDITIONS (for Certification Action 2):

In addition to the four standard conditions, the California Department of Transportation shall satisfy the following:

1. A finalized Streambed Alteration Agreement must be issued by the California Department of Fish and Game before this project may proceed. A copy of the finalized Streambed Alteration Agreement shall be submitted to the Central Valley Water Board.

CENTRAL VALLEY WATER BOARD CONTACT PERSON:

Bridget Supple, Environmental Scientist
(559) 445-5919
bsupple@waterboards.ca.gov

WATER QUALITY CERTIFICATION:

I hereby issue an order certifying that the proposed discharge from the Goshen to Kingsburg Six-Lane project will comply with the applicable provisions of Sections 301 ("Effluent Limitations"), 302 ("Water Quality Related Effluent Limitations"), 303 ("Water Quality Standards and Implementation Plans"), 306 ("National Standards of Performance"), and 307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act. This discharge is also regulated under State Water Resources Control Board Water Quality Order No. 2003-0017-DWQ, "Statewide General Waste Discharge Requirements For Dredged Or Fill Discharges That Have Received State Water Quality Certification (General WDRs)," which is enclosed.

Except insofar as may be modified by any preceding conditions, all certification actions are contingent on (a) the discharge being limited and all proposed mitigations being completed in strict compliance with the applicant's project description and the attached Project Information Sheet, and (b) compliance with all applicable requirements of the Central Valley Water Board's *Water Quality Control Plan for the Tulare Lake Basin, Second Edition, Revised January 2004*.


Pamela C. Creedon
Executive Officer

Enclosures: Project Information
Water Quality Order No. 2003-0017-DWQ

cc: (see next page)

cc: Dave Smith, Chief, Wetlands Regulatory Office, U.S. Environmental Protection Agency,
Region 9, San Francisco
Kathleen Dadey, Chief, Sacramento South Branch, Regulatory Unit, Department of the
Army, Corps of Engineers, Sacramento
Bill Orme, Water Quality Certification Unit Chief, Division of Water Quality, State Water
Resources Control Board, Sacramento
Jeffrey Single, Regional Manager, San Joaquin Valley-Southern Sierra Region,
California Department of Fish and Game, Fresno

**ATTACHMENT 1
PROJECT INFORMATION**

Application Date: 11 May 2009

Applicant: California Department of Transportation (Caltrans)

Applicant Representatives: Charles Walbridge, Project Biologist

Project Name: Goshen to Kingsburg Six-Lane Project

Applicant Number: RN #377; WDID No. 5C10CR00008

Project Location: Linear project along State Route 99 between Goshen and Kingsburg. Areas of impact: (Kings River: 35.49702° Latitude, 119.52989° Longitude; Section 36 of Township 16 South, Range 22 East, MDB&M); (Traver Canal: 36.45903° Latitude, 119.49303° Longitude; Section 17 of Township 17 South, Range 23 East, MDB&M); (Northern Tributary to Cross Creek: 36.41481° Latitude, 119.46341° Longitude; Section 34 of Township 17 South, Range 23 East, MDB&M), and (Cross Creek: 36.40346° Latitude, 119.45600° Longitude; Section 35 of Township 17 South, Range 23 East, MDB&M)

Project Duration: September 2010 through August 2013

County: Fresno and Tulare

Receiving Water(s) (hydrologic unit): (Kings River and Traver Canal: Tulare Lake Hydrologic Basin, South Valley Floor Hydrologic Unit, Alta Hydrologic Area, # 551.60); (Northern Tributary to Cross Creek and Cross Creek: Tulare Lake Hydrologic Basin, South Valley Floor Hydrologic Unit, Kaweah Delta Hydrologic Area, # 558.10).

Water Body Type: River, Canal, Tributary to Creek, and Creek

Designated Beneficial Uses: The designated beneficial uses for the Kings River and the Traver Canal impact areas (tributaries to the Kings River between Friant Kern Canal and the People's Weir) are: municipal and domestic supply; agricultural supply; industrial process supply; water contact recreation; non-contact water recreation; warm freshwater habitat; wildlife habitat; and groundwater recharge. The designated beneficial uses for the Northern Tributary to Cross Creek and Cross Creek impact areas (Valley Floor Waters) are: agricultural supply;

industrial service supply; industrial process supply; contact recreation; non-contact water recreation; warm freshwater habitat; wildlife habitat; rare, threatened, or endangered species; and groundwater recharge.

Project Description: Widen State Route 99 between Goshen and Kingsburg to six lanes. The northbound and southbound bridges over the Kings River will be removed and replaced with one larger structure. Other bridges and culverts along the route will be widened and modified over the Traver Canal, the Northern Tributary to Cross Creek, Cross Creek, and other waterways, drainages, and irrigation canals.

Preliminary Water Quality Concerns: Increased turbidity, deposition of settleable material, and transport of pollutants to the Kings River, Cross Creek, Northern Tributary to Cross Creek, Traver Canal, and other waterways, drainages, and irrigation canals.

Proposed Mitigation To Address Concerns: Best Management Practices (BMPs) will be implemented during construction. Work will take place in Cross Creek, Northern Tributary to Cross Creek, the Traver Canal, and other waterways, drainages, and irrigation canals when the channels are expected to be dry. However, flows are expected to be present in the Kings River, so a water diversion plan and construction dewatering plan will be implemented. All temporarily affected areas will be restored to pre-project contours and conditions upon completion of work activities.

Fill/Excavation Area: The project will result in the following permanent and temporary impacts:

	Permanent Impacts	Temporary Impacts
Jurisdictional wetland at Kings River	0.004 acres	0.25 acres
Riparian areas at Kings River, Northern Tributary to Cross Creek, and Cross Creek	0.136 acres	2.14 acres
Unvegetated streambed of Traver Canal	0.076 acres	0.217 acres

Dredge Volume (cy): None

U.S. Army Corps of Engineers Permit: Caltrans applied for coverage under Nationwide Permit Nos. 14 and 33 on 22 April 2009.

**Department of Fish
and Game Streambed
Alteration Agreement:**

Caltrans applied for a Streambed Alteration Agreement on 22 April 2009.

CEQA Compliance:

Caltrans prepared a joint CEQA/NEPA document titled "Environmental Assessment with Finding of No Significant Impact and Initial Study with Mitigated Negative Declaration" in October 2006, and filed a Notice of Determination (SCH No. 2006051047) with the State Clearinghouse on 15 February 2007.

**Compensatory
Mitigation:**

Caltrans proposes to restore 2.53 acres of riparian area at the Kings River impact area.

**Application Fee
Provided:**

Caltrans submitted a fee of \$8,401.00 on 11 May 2009, as required by 23 CCR Section 3833(b)(2)(A).

STATE WATER RESOURCES CONTROL BOARD

WATER QUALITY ORDER NO. 2003 - 0017 - DWQ

**STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR
DREDGED OR FILL DISCHARGES THAT HAVE RECEIVED
STATE WATER QUALITY CERTIFICATION (GENERAL WDRs)**

The State Water Resources Control Board (SWRCB) finds that:

1. Discharges eligible for coverage under these General WDRs are discharges of dredged or fill material that have received State Water Quality Certification (Certification) pursuant to federal Clean Water Act (CWA) section 401.
2. Discharges of dredged or fill material are commonly associated with port development, stream channelization, utility crossing land development, transportation water resource, and flood control projects. Other activities, such as land clearing, may also involve discharges of dredged or fill materials (e.g., soil) into waters of the United States.
3. CWA section 404 establishes a permit program under which the U.S. Army Corps of Engineers (ACOE) regulates the discharge of dredged or fill material into waters of the United States.
4. CWA section 401 requires every applicant for a federal permit or license for an activity that may result in a discharge of pollutants to a water of the United States (including permits under section 404) to obtain Certification that the proposed activity will comply with State water quality standards. In California, Certifications are issued by the Regional Water Quality Control Boards (RWQCB) or for multi-Region discharges, the SWRCB, in accordance with the requirements of California Code of Regulations (CCR) section 3830 et seq. The SWRCB's water quality regulations do not authorize the SWRCB or RWQCBs to waive certification, and therefore, these General WDRs do not apply to any discharge authorized by federal license or permit that was issued based on a determination by the issuing agency that certification has been waived. Certifications are issued by the RWQCB or SWRCB before the ACOE may issue CWA section 404 permits. Any conditions set forth in a Certification become conditions of the federal permit or license if and when it is ultimately issued.
5. Article 4, of Chapter 4 of Division 7 of the California Water Code (CWC), commencing with section 13260(a), requires that any person discharging or proposing to discharge waste, other than to a community sewer system, that could affect the quality of the waters of the State,¹ file a report of waste discharge (ROWD). Pursuant to Article 4, the RWQCBs are required to prescribe waste discharge requirements (WDRs) for any proposed or existing discharge unless WDRs are waived pursuant to CWC section 13269. These General WDRs fulfill the requirements of Article 4 for proposed dredge or fill discharges to waters of the United States that are regulated under the State's CWA section 401 authority.

¹ "Waters of the State" as defined in CWC Section 13050(e)

6. These General WDRs require compliance with all conditions of Certification orders to ensure that water quality standards are met.
7. The U.S. Supreme Court decision of *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001) (the *SWANCC* decision) called into question the extent to which certain "isolated" waters are subject to federal jurisdiction. The SWRCB believes that a Certification is a valid and enforceable order of the SWRCB or RWQCBs irrespective of whether the water body in question is subsequently determined not to be federally jurisdictional. Nonetheless, it is the intent of the SWRCB that all Certification conditions be incorporated into these General WDRs and enforceable hereunder even if the federal permit is subsequently deemed invalid because the water is not deemed subject to federal jurisdiction.
8. The beneficial uses for the waters of the State include, but are not limited to, domestic and municipal supply, agricultural and industrial supply, power generation, recreation, aesthetic enjoyment, navigation, and preservation and enhancement of fish, wildlife, and other aquatic resources.
9. Projects covered by these General WDRs shall be assessed a fee pursuant to Title 23, CCR section 3833.
10. These General WDRs are exempt from the California Environmental Quality Act (CEQA) because (a) they are not a "project" within the meaning of CEQA, since a "project" results in a direct or indirect physical change in the environment (Title 14, CCR section 15378); and (b) the term "project" does not mean each separate governmental approval (Title 14, CCR section 15378(c)). These WDRs do not authorize any specific project. They recognize that dredge and fill discharges that need a federal license or permit must be regulated under CWA section 401 Certification, pursuant to CWA section 401 and Title 23, CCR section 3855, et seq. Certification and issuance of waste discharge requirements are overlapping regulatory processes, which are both administered by the SWRCB and RWQCBs. Each project subject to Certification requires independent compliance with CEQA and is regulated through the Certification process in the context of its specific characteristics. Any effects on the environment will therefore be as a result of the certification process, not from these General WDRs. (Title 14, CCR section 15061(b)(3)).
11. Potential dischargers and other known interested parties have been notified of the intent to adopt these General WDRs by public hearing notice.
12. All comments pertaining to the proposed discharges have been heard and considered at the November 4, 2003 SWRCB Workshop Session.
13. The RWQCBs retain discretion to impose individual or general WDRs or waivers of WDRs in lieu of these General WDRs whenever they deem it appropriate. Furthermore, these General WDRs are not intended to supersede any existing WDRs or waivers of WDRs issued by a RWQCB.

IT IS HEREBY ORDERED that WDRs are issued to all persons proposing to discharge dredged or fill material to waters of the United States where such discharge is also subject to the water quality certification requirements of CWA section 401 of the federal Clean Water Act (Title 33 United States Code section 1341), and such certification has been issued by the applicable RWQCB or the SWRCB, unless the applicable RWQCB notifies the applicant that its discharge will be regulated through WDRs or waivers of WDRs issued by the RWQCB. In order to meet the provisions contained in Division 7 of CWC and regulations adopted thereunder, dischargers shall comply with the following:

1. Dischargers shall implement all the terms and conditions of the applicable CWA section 401 Certification issued for the discharge. This provision shall apply irrespective of whether the federal license or permit for which the Certification was obtained is subsequently deemed invalid because the water body subject to the discharge has been deemed outside of federal jurisdiction.
2. Dischargers are prohibited from discharging dredged or fill material to waters of the United States without first obtaining Certification from the applicable RWQCB or SWRCB.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on November 19, 2003.

AYE: Arthur G. Baggett, Jr.
Peter S. Silva
Richard Katz
Gary M. Carlton
Nancy H. Sutley

NO: None.

ABSENT: None.

ABSTAIN: None.


Debbie Irvin
Clerk to the Board



Central Region
1234 East Shaw Avenue
Fresno, California 93710
(559) 243-4005
<http://www.dfg.ca.gov>

July 8, 2009

Zachary Parker
California Department of Transportation
2015 East Shields Avenue, Suite 100
Fresno, California 93726

Subject: Stream Alteration Agreement No. 2009-0078-R4
Kings River, Northern Tributary of Cross Creek and Cross Creek – Tulare County

Dear Mr. Parker:

The Department of Fish and Game has completed the agreement process. A Notice of Determination will be filed with the Office of Planning and Research, in accordance with California Environmental Quality Act (CEQA).

Your copy of the signed Agreement is enclosed. You may proceed with your Project according to the terms and provisions of your Stream Alteration Agreement, if you have obtained all other permits required by local, other State, and Federal agencies. The Department's determination may be legally challenged within 30 days following the filing of the Notice of Determination. As a result, you may wish, but are not required, to delay commencement of your Project until after the 30-day period expires.

If you have any questions regarding this matter, please contact Laura Peterson-Diaz, Environmental Scientist, at the above letterhead address or by telephone at (559) 243-4014, extension 225. Thank you for your cooperation.

Sincerely,

Jeffrey R. Single, Ph.D.
Regional Manager

Enclosure

NOTICE OF DETERMINATION

TO: Office of Planning and Research
Post Office Box 3044
Sacramento, California 95814

FROM: California Department of Fish and Game
Central Region
1234 East Shaw Avenue
Fresno, California 93710

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code

PROJECT TITLE: State Route 99 – Goshen to Kingsburg 6-Lane Project - Agreement 2009-0078-R4

STATE CLEARINGHOUSE NUMBER: 2006051047

LEAD AGENCY: California Department of Transportation
CONTACT: Charles Walbridge (559) 243-8201

RESPONSIBLE AGENCY: California Department of Fish and Game
CONTACT: Laura Peterson-Diaz (559) 243-4017, extension 225

PROJECT LOCATION: Three stream crossing locations on State Route (SR) 99. 1) the Kings River at Post Mile (PM) 52.6-52.7 in Section 36 of Township 16 South, Range 22 East in Tulare County; 2) the Northern Tributary of Cross Creek at PM 45.7 in Section 27 of Township 17 South, Range 23 East in Tulare County; 3) Cross Creek at PM 44.8-44.9 in Section 35 of Township 17 South, Range 23 East in Tulare County.

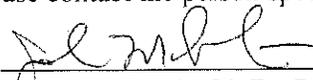
PROJECT DESCRIPTION: The California Department of Fish and Game is executing a Lake and Streambed Alteration Agreement pursuant to Section 1602 of the Fish and Game Code to the Project applicant. Caltrans proposes the following activities: at the Kings River both the northbound and southbound bridges will be replaced. Temporary gravel fill will be placed to allow access to erect the false-work and drive new bridge piles. Water will be channeled between the gravel pads. Work at the other two locations will be done when the channel is dry. Northern Tributary of Cross Creek: The northbound bridge will be replaced and the southbound bridge will be widened to accommodate the additional lanes in the median. Cross Creek: Both the northbound and southbound bridges will be widened to accommodate the additional lanes in the median.

This is to advise that the California Department of Fish and Game as a Responsible Agency approved the Project described above and has made the following determinations regarding the above described project.

1. The Project will not have a significant effect on the environment.
2. A Mitigated Negative Declaration was prepared for this Project pursuant to the provisions of CEQA.
3. Mitigation measures were made a condition of the approval of the Project.
4. A Statement of Overriding Considerations was not adopted for this Project.
5. Findings were made pursuant to the provisions of CEQA.

This is to certify that a copy of the Mitigated Negative Declaration prepared for this Project is available to the general public and may be reviewed at: Caltrans-District 6 Environmental Planning, 2015 Shields Avenue, Suite 100, Fresno, California 93726. Please contact the person specified above.

Date: July 14, 2009

for 
Jeffrey R. Single, Ph.D., Regional Manager
Central Region
California Department of Fish and Game

Date received for filing at OPR: _____

AGREEMENT



California Fish and Game Code Section 1602
Stream Alteration Agreement No. 2009-0078-R4
California Department of Transportation
Kings River, Northern Tributary of Cross Creek
and Cross Creek - Tulare County
TUL 99 PM 66.4-86.8 EA # 06-324500

Parties:

California Department of Fish and Game
Central Region
1234 East Shaw Avenue
Fresno, California 93710

California Department of Transportation
Zachary Parker
2015 East Shields Avenue, Suite 100
Fresno, California 93726

1 WHEREAS:

2
3 1. Mr. Charles Walbridge, representing the California Department of Transportation
4 (referred to as "Caltrans") on May 11, 2009, notified ("Notification" No. 2009-0078-R4)
5 the Department of Fish and Game (Department) of their intent to divert or obstruct the
6 natural flow of, or change the bed or banks of, or use materials from the Kings River,
7 Northern Tributary of Cross Creek and Cross Creek in Tulare County, waters over
8 which the Department asserts jurisdiction pursuant to Division 2, Chapter 6 of the
9 California Fish and Game Code.

10
11 2. Caltrans may not commence any activity that is subject to Fish and Game Code
12 Sections 1600 et seq., until the Department has found that such Project shall not
13 substantially adversely affect an existing fish or wildlife resource or until the
14 Department's proposals, or the decisions of a panel of arbitrators, have been
15 incorporated into such projects.

16
17 3. Fish and Game Code Sections 1600 et seq., make provisions for the negotiation of
18 agreements regarding the delineation and definition of appropriate activities, Project
19 modifications and/or specific measures necessary to protect fish and wildlife resources.

20
21 4. The Department has determined that without the protective features identified in
22 this Agreement, the activities proposed in the Notification could substantially adversely
23 affect fish and wildlife.

Agreement No. 2009-0078-R4
Department of Transportation
Kings River, Northern Tributary of Cross
Creek and Cross Creek - Tulare County

1 **NOW THEREFORE, IT IS AGREED THAT:**

2
3 1. The receipt of this document ("Agreement"), by Caltrans, satisfies the
4 Department's requirement to notify Caltrans of the existence of an existing fish and
5 wildlife resource that may be substantially adversely affected by the Project that is
6 described in the Notification.

7
8 2. The contents of this Agreement constitute the Department's proposals as to
9 measures necessary to protect fish and wildlife resources, and satisfy the Department's
10 requirement to submit these proposals to Caltrans.

11
12 3. The signature of Caltrans' representative on this Agreement constitutes Caltrans'
13 commitment to incorporate the Department's proposals into the Project that is described
14 in the Notification.

15
16 4. This Agreement does not exempt Caltrans from complying with all other applicable
17 local, State and Federal law, or other legal obligations.

18
19 5. This Agreement, alone, does not constitute or imply the approval or endorsement
20 of a Project, or of specific Project features, by the Department, beyond the
21 Department's limited scope of responsibility, established by Code Sections 1600 et seq.
22 This Agreement does not therefore assure concurrence, by the Department, with the
23 issuance of permits from this or any other agency. Independent review and
24 recommendations shall be provided by the Department as appropriate on those
25 projects where local, State or Federal permits or environmental reports are required.

26
27 6. This Agreement does not authorize the "take" (defined in Fish and Game Code
28 Section 86 as hunt, pursue, catch, capture, or kill; or attempt to hunt, pursue, catch,
29 capture, or kill) of State-listed threatened or endangered species. If the Operator, in the
30 performance of the agreed work, discovers the presence of a listed species in the
31 Project work area, work shall stop immediately. Caltrans shall not resume activities
32 authorized by this Agreement until such time as valid "take" permits are obtained from
33 the Department, pursuant to Fish and Game Code Sections 2081(a) and 2081(b) as
34 appropriate.

35
36 7. To the extent that the Provisions of this Agreement provide for the diversion of
37 water, they are agreed to with the understanding that Caltrans possesses the legal right
38 to so divert such water.

39
40 8. To the extent that the Provisions of this Agreement provide for activities that
41 require Caltrans to trespass on another owner's property, they are agreed to with the
42 understanding that Caltrans possesses the legal right to so trespass.

43
44 9. To the extent that the Provisions of this Agreement provide for activities that are
45 subject to the authority of other public agencies, said activities are agreed to with the

Agreement No. 2009-0078-R4
Department of Transportation
Kings River, Northern Tributary of Cross
Creek and Cross Creek - Tulare County

1 understanding that all appropriate permits and authorizations shall be obtained prior to
2 commencing agreed activities.

3
4 10. All Provisions of this Agreement remain in force throughout the term of the
5 Agreement. Any Provision of the Agreement may be amended at any time, provided
6 such amendment is agreed to in writing by both parties. Mutually approved
7 amendments become part of the original Agreement and are subject to all previously
8 negotiated Provisions. The Agreement may be terminated by either party, subject to
9 30 days written notification.

10
11 11. Caltrans shall provide a copy of the Agreement to the Project supervisors and all
12 contractors and subcontractors. Copies of the Agreement shall be available at work
13 sites during all periods of active work and shall be presented to Department personnel
14 upon demand.

15
16 12. Caltrans agrees to provide the Department access to the Project site at any time to
17 ensure compliance with the terms, conditions, and Provisions of this Agreement.

18
19 13. Caltrans and any contractor or subcontractor, working on activities covered by this
20 Agreement, are jointly and separately liable for compliance with the Provisions of this
21 Agreement. Any violation of the Provisions of this Agreement is cause to stop all work
22 immediately until the problem is reconciled. Failure to comply with the Provisions and
23 requirements of this Agreement may result in prosecution.

24
25 14. Caltrans assumes responsibility for the restoration of any fish and wildlife habitat
26 which may be impaired or damaged either directly or, incidental to the Project, as a
27 result of failure to properly implement or complete the mitigation features of this
28 Agreement, or from activities which were not included in the Caltrans' Notification.

29
30 15. It is understood that the Department enters into this Agreement for purposes of
31 establishing protective features for fish and wildlife, in the event that a Project is
32 implemented. The decision to proceed with the Project is the sole responsibility of
33 Caltrans, and is not required by this Agreement. It is agreed that all liability and/or
34 incurred costs, related to or arising out of Caltrans' Project and the fish and wildlife
35 protective conditions of this Agreement, remain the sole responsibility of Caltrans.
36 Caltrans agrees to hold harmless and defend the Department against any related claim
37 made by any party or parties for personal injury or other damage.

38
39 16. The terms, conditions, and Provisions contained herein constitute the limit of
40 activities agreed to and resolved by this Agreement. The signing of this Agreement
41 does not imply that Caltrans is precluded from doing other activities at the site.
42 However, activities not specifically agreed to and resolved by this Agreement are
43 subject to separate notification pursuant to Fish and Game Code Sections 1600 et seq.

Agreement No. 2009-0078-R4
Department of Transportation
Kings River, Northern Tributary of Cross
Creek and Cross Creek - Tulare County

1 **California Environmental Quality Act (CEQA) Compliance:** In approving this
2 Agreement, the Department is independently required to assess the applicability of
3 CEQA. The features of this Agreement shall be considered as part of the overall
4 Project description. Caltrans' concurrence signature on this Agreement serves as
5 confirmation to the Department that the activities that shall be conducted under the
6 terms of this Agreement are consistent with the Project described in Notification
7 No. 2009-0078-R4. This Project is part of the Goshen – Kingsburg 6 Lane Freeway
8 Project for which Caltrans submitted a Finding of No Significant Impact and Initial Study
9 with Mitigated Negative Declaration October 2006, State Clearinghouse Number
10 2006051047.

11
12 The Department, as a CEQA Responsible Agency, shall make findings and submit a
13 Notice of Determination to the State Clearinghouse upon signing this Agreement.

14
15 This Agreement contains a Monitoring and Reporting Program (MRP), to incorporate
16 monitoring and reporting requirements for the activities authorized in this Agreement.

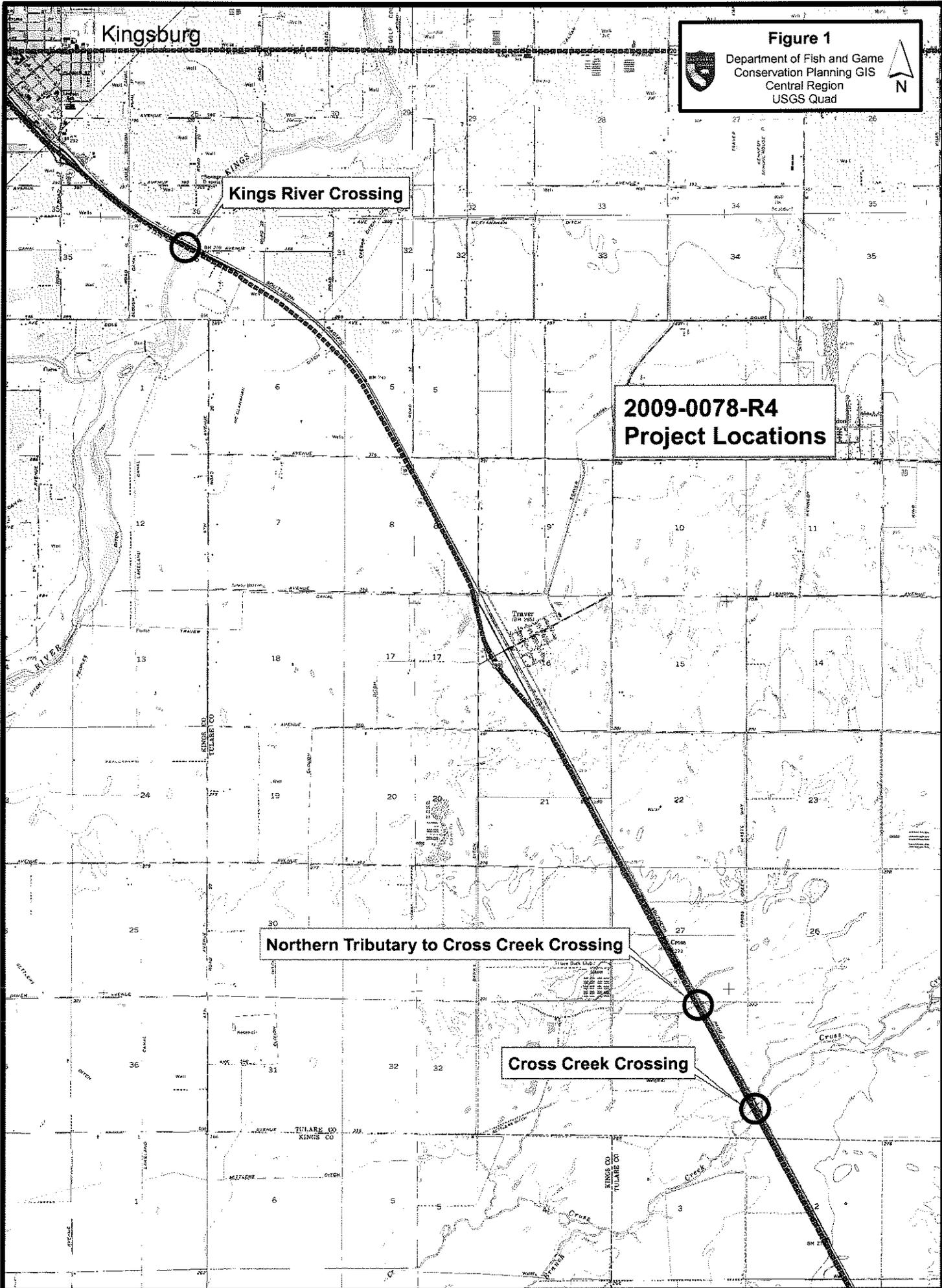
17
18 **Project Location:** The work authorized by this Agreement will occur at three crossing
19 locations on State Route (SR) 99: 1) the Kings River at Post Mile (PM) 52.6-52.7 in
20 Section 36 of Township 16 South, Range 22 East in Tulare County; 2) the Northern
21 Tributary to Cross Creek at PM 45.7 in Section 27 of Township 17 South, Range 23
22 East in Tulare County; and 3) Cross Creek at PM 44.8-44.9 in Section 35 of
23 Township 17 South, Range 23 East in Tulare County (**Figure 1**).

24
25 **Project Description:** Caltrans' Notification includes Fish and Game Notification Form
26 FG2023 and construction plans. The Notification comprises Caltrans' Project
27 description, and it is used as the basis for establishing the protective Provisions that are
28 included in this Agreement. Any changes or additions to the Project as described in the
29 Notification shall require additional consultation and protective Provisions. The
30 Department's concurrence with Caltrans' CEQA Determination is based upon Caltrans'
31 commitment to full implementation of the Provisions of this Agreement. Caltrans has
32 proposed the following scope of work. The bulleted items comprise the activities
33 authorized by this Agreement.

- 34
- 35 • The Kings River: Both the northbound and southbound bridges will be replaced.
36 The two bridges are concrete with steel rebar skeleton. Work in the river will be
37 necessary to erect the false-work and drive new bridge piles. Temporary fill in the
38 river for construction access will require 2,370 cubic yards of gravel. Water will be
39 channeled between the gravel pads. Forty-eight-inch steel/concrete piles will
40 occupy 210 cubic yards and structure backfill will occupy 107 cubic yards. New
41 rock slope protection (RSP) will occupy 0.056 acres.
 - 42
43 • Northern Tributary to Cross Creek: Both the northbound and southbound bridges
44 are reinforced box culverts. The northbound bridge will be replaced and the
45 southbound bridge will be widened to accommodate the additional lanes in the

Agreement No. 2009-0078-R4
Department of Transportation
Kings River, Northern Tributary of Cross
Creek and Cross Creek - Tulare County

Figure 1
Department of Fish and Game
Conservation Planning GIS
Central Region
USGS Quad



Kingsburg

Kings River Crossing

2009-0078-R4
Project Locations

Northern Tributary to Cross Creek Crossing

Cross Creek Crossing

1 median. Work on the bridges will require 261 cubic yards of concrete and 61 cubic
2 yards of backfill. Water diversion will not be necessary as work will take place
3 when the channel is dry (March to December).

- 4
5 • Cross Creek: Both the northbound and southbound bridges are reinforced box
6 culverts which will be widened to accommodate the additional lanes in the median.
7 Work on the bridges will require 120 cubic yards of concrete and 25 cubic yards of
8 backfill. Water diversion will not be necessary as work will take place when the
9 channel is dry (March to December).

10
11 **Plant and Animal Species of Concern:** This Agreement is intended to minimize and
12 mitigate adverse impacts to the wildlife resources that may occupy this area of the
13 Kings River, Northern Tributary of Cross Creek and Cross Creek and the immediate
14 adjacent habitat. The California Natural Diversity Database shows the following
15 species in the Project vicinity:

16
17 Burrowing owl (*Athene cunicularia*), Species of Special Concern
18 California tiger salamander (*Ambystoma californiense*), Federal Threatened, State
19 Candidate
20 Vernal pool fairy shrimp (*Branchinecta lynchi*), Federal Threatened
21 Vernal pool tadpole shrimp (*Lepidurus packardii*), Federal Endangered
22 Western mastiff bat (*Eumops perotis californicus*), Species of Special Concern

23
24 Caltrans' Natural Environment Study (NES) and Biological Assessment (BA) also
25 addressed the following species:

26
27 Pallid bat (*Antrozous pallidus*), Species of Special Concern
28 San Joaquin kit fox (*Vulpes macrotis mutica*), Federal Endangered and State
29 Threatened
30 Swainson's hawk (*Buteo swainsoni*), State Threatened
31 Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), Federal
32 Endangered
33 Yuma Myotis bat (*Myotis yumanensis*), Species of Special Concern

34
35 The above species as well as birds, mammals, reptiles, amphibians, fish, invertebrates
36 and plants that comprise the local ecosystem could be subject to potential generated
37 impacts from this Project if the following Provisions are not followed.

38 39 **PROVISIONS:**

40 41 General

42
43 1. The Notification, together with all supporting documents, is hereby incorporated
44 into this Agreement to describe the location and features of the proposed Project.
45 Caltrans agrees that all work shall be done as described in the Notification and
46 supporting documents, incorporating all wildlife resource protection features, mitigation
47 measures, and Provisions as described in this Agreement. Caltrans further agrees to

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Creek and Cross Creek - Tulare County

1 notify the Department of any modifications that need to be made to the Project plans
2 submitted to the Department. At the discretion of the Department, modifications may
3 be deemed minor, requiring an amendment to this Agreement, or substantial requiring
4 the submission of a new notification application. If the later is the case, this Agreement
5 becomes null and void. Failure to notify the Department of changes to the original
6 plans or subsequent amendments to this Agreement may result in the Department
7 suspending or canceling this Agreement.

8
9 2. Before the start of construction/work activities covered under this Agreement, all
10 workers shall have received training from Caltrans' staff, or approved alternate trainer,
11 on the content of this Agreement, the resources at stake, and the legal consequences
12 of non-compliance.

13
14 3. When known, prior to beginning work, Caltrans shall provide a construction/work
15 schedule to the Department (fax to Laura Peterson-Diaz, Environmental Scientist, at
16 (559) 243-4020). Please reference the Agreement number. Caltrans shall also notify
17 the Department upon the completion of the activities covered by this Agreement.

18
19 4. Agreed activities within the bed, bank or channel may commence any time after
20 the Department has signed this Agreement. This Agreement shall remain in effect for
21 five (5) years beginning on the date signed by the Department. If the Project is not
22 completed prior to the expiration date defined above, Caltrans shall contact the
23 Department to negotiate a new expiration date and any new requirements.

24 Flagging/Fencing

25
26
27 5. Within the riparian corridor, Caltrans shall identify the upstream and downstream
28 limits of the minimum work area required, access routes, the Project footprint, plus all
29 Environmentally Sensitive Areas (ESA). These boundaries shall be defined by the
30 Caltrans' Project engineer and biologist and flagged/fenced prior to the beginning of
31 construction. These limits shall not extend beyond Caltrans' right of way and/or the
32 construction easement, and shall be confined to the minimal area needed to
33 accomplish the proposed work. Flagging/fencing shall be maintained in good repair for
34 the duration of the Project.

35 Wildlife

36
37
38 6. An approved biologist shall perform general wildlife surveys of the Project area
39 (including access routes and storage areas) prior to Project construction start with
40 particular attention to evidence of the presence of the species listed above and shall
41 report any possible adverse affect to fish and wildlife resources not originally reported.
42 If the survey shows presence of any wildlife species which could be impacted, Caltrans
43 shall contact the Department and mitigation, specific to each incident, shall be
44 developed. If any State- or Federal-listed threatened or endangered species are found
45 within the proposed work area or could be impacted by the work proposed, a new
46 Agreement and/or a 2081(b) State Incidental Take Permit may be necessary and a new
47 CEQA analysis may need to be conducted, before work can begin.

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1 7. If work is done between March 1 and September 1, then in order to protect nesting
2 birds, Caltrans' biologist shall make a survey for nesting activity in and adjacent to the
3 defined "work area", before construction begins. If any nesting activity is observed,
4 (including cavity nesting), the nests and trees shall not be damaged or removed until
5 the young have fledged and left the nest. Caltrans shall obtain Department approval
6 prior to damaging or removing nesting trees.

7
8 8. Raptors: Survey for nesting activity of raptors, including Swainson's hawks, within
9 a 0.25 miles (extend to 0.5 miles in suitable riparian habitat) of the construction site.
10 Surveys shall be conducted at appropriate nesting times and concentrate on mature
11 trees. If any active nests are observed, these nests and nest trees shall be designated
12 an ESA and protected (while occupied) with a minimum 500-foot buffer during Project
13 construction. Caltrans shall also consult with the Department for any further
14 requirements.

15
16 9. Burrowing owls: If any ground-disturbing activities will occur during the burrowing
17 owl nesting season (approximately February 1 through August 31), the Department
18 recommends that a pre-construction site survey be conducted by a qualified biologist
19 no more than 30 days before the onset of any ground-disturbing activities. If signs
20 (i.e., pellets, feathers, tracks, or scat) of burrowing owls are observed at burrow
21 entrances within 300 feet of the defined work area, a qualified biologist shall perform a
22 Phase III Burrowing Owl Survey as described in the 1997 California Burrowing Owl
23 Consortium's Survey Protocol and Mitigation Guidelines.

24
25 The Department's Staff Report on Burrowing Owl Mitigation (CDFG 1995) recommends
26 that impacts to occupied burrows be avoided by implementation of a no-construction
27 buffer zone of a minimum distance of 250 feet, unless a qualified biologist approved by
28 the department verifies through non-invasive methods that either: 1) the birds have not
29 begun egg laying and incubation; or 2) that juveniles from the occupied burrows are
30 foraging independently and are capable of independent survival. Failure to implement
31 this buffer zone could cause adult burrowing owls to abandon the nest, cause eggs or
32 young to be directly impacted (crushed), and/or result in reproductive failure.

33
34 If burrowing owls occupy the site, during the non-breeding season, a passive relocation
35 effort may be instituted.

36
37 10. Swallows: If Caltrans cannot avoid work on the bridges where there is the
38 potential it would disturb nesting swallows (February 15 through August 15), then prior
39 to February 1, of each year, Caltrans shall remove all existing inactive nests which
40 would be destroyed by the Project. Caltrans shall continue to discourage new nest
41 building in places where they would be disturbed, using methods developed in
42 consultation with the Caltrans District Biologist and the Department. Prior to nesting
43 season, a swallow exclusion device, with visual warnings for the birds to prevent
44 entanglement, must be installed. Where disturbance shall occur, nesting must be
45 discouraged throughout the nesting season.

1 11. Bats: No bats shall be disturbed without specific notice to and consultation with
2 the Department. Pre-construction surveys by a qualified biologist shall be performed to
3 determine if bat species are utilizing the bridge for roosting. If bats are using the
4 existing bridge as a roosting site, exclusion of these bats shall take place a minimum of
5 four (4) weeks prior to construction. If after four (4) weeks exclusion measures are
6 unsuccessful and bat species still utilize the bridge for roosting, Caltrans shall contact
7 the Department and mitigation shall be developed in consultation with the Department.

8
9 12. Vernal pool species: Protocol surveys were done for vernal pool crustaceans at
10 the one seasonal pool within the Project Impact Area in 2002/2003 and 2003/2004 with
11 negative results. This pool was deemed by Caltrans as unsuitable for California tiger
12 salamander, due to the fact that the water does not persist the minimum ten (10) weeks
13 for California tiger salamander to metamorphose, even in wet years. All construction
14 work in the Cross Creek area shall be limited to the existing right-of-way. No suitable
15 aquatic or upland habitat for tiger salamanders shall be impacted.

16
17 13. If any wildlife is encountered during the course of construction, said wildlife shall
18 be allowed to leave the construction area unharmed.

19
20 Vegetation

21
22 14. For this Project, 177 linear feet of riparian vegetation (including the button bush,
23 Baltic rush, and common rush) will be temporarily impacted and 100 linear feet
24 permanently impacted as a result of planned construction activities. In addition to the
25 smaller vegetation and shrubs noted above, the Project will remove 96 Goodding's
26 willows (*Salix gooddingii*), and 60 narrow leafed willows (*Salix exigua*) over four (4)
27 inches but less than 24 inches in diameter at breast height (DBH), and also 6 Oregon
28 Ash (*Fraxinus latifolia*) between 10 inches and 36 inches DBH. A Proposed Vegetation
29 Replacement Plan included with the notification states that all vegetation will be
30 replaced at a minimum 3:1 ratio. The plant monitoring and reporting period for the
31 replacement trees will be three (3) years from the last date of planting and a minimum
32 70 percent survivorship is necessary.

33
34 15. Elderberry bushes near the Project shall be completely avoided or mitigated
35 according to the United States Fish and Wildlife Service regulations.

36
37 16. Precautions shall be taken to avoid any other damage to vegetation by people or
38 equipment for the duration of the Project.

39
40 Vehicles

41
42 17. Construction vehicles and equipment will need access to the stream banks and
43 bed for this Project. All other areas adjacent to the work site shall be considered an
44 ESA and shall remain off-limits to construction equipment.

1 Pollution

2
3 18. Caltrans and all contractors and subcontractors shall be subject to the pollution
4 protective and other features of Department of Transportation Standard Specifications
5 Section 7-1.01G and Fish and Game Code Sections 5650 and 12015.

6
7 19. Staging and storage areas for equipment, materials, fuels, lubricants, and solvents
8 shall be located outside of the stream channel and banks. Any equipment or vehicles
9 driven and/or operated within or adjacent to the creek shall be checked and maintained
10 daily to prevent leaks of materials that, if introduced to water, could be deleterious to
11 aquatic life. If a spill should occur, cleanup shall begin immediately. The Department
12 shall be notified as soon as possible by Caltrans and shall be consulted regarding
13 further cleanup procedures.

14
15 Erosion

16
17 20. All disturbed soils shall be stabilized to reduce erosion potential, both during and
18 following construction. Erosion control Best Management Practices (BMPs) shall be
19 applied to all disturbed areas.

20
21 Fill/Spoil

22
23 21. Rock, gravel, and/or other materials shall not be imported into or moved within the
24 stream, except as otherwise addressed in this Agreement. Only on-site materials and
25 clean imported fill shall be used to complete the Project. Fill shall be limited to the
26 minimal amount necessary to accomplish the agreed activities. Excess and temporary
27 fill material shall be moved off-site at Project completion.

28
29 22. Spoil storage sites shall not be located within the stream, or where spoil could be
30 washed into the stream, or where it shall cover vegetation.

31
32 Restoration

33
34 23. Excess material must be removed from the Project site, pursuant to Department of
35 Transportation Standard Specifications Section 7-1.13.

36
37 24. Caltrans shall make the final contour of the site match the adjacent slope of the
38 land and provide the appropriate surface water drainage. All areas subject to
39 temporary ground disturbance, including storage and staging areas, temporary roads,
40 pipeline corridors, etc., shall be recontoured, if necessary, and revegetated to promote
41 restoration of the area.

42
43 25. Caltrans shall follow Revegetation Plan submitted, as indicated in Provision 12
44 above. The plan includes proposed monitoring, maintenance activities including
45 irrigation and weeding as needed, and replanting if necessary to ensure a minimum
46 of 70 percent survivorship for three (3) years, after the last planting, (i.e., if 30 percent
47 or more of any of the species have not survived or are at risk of not surviving, and
48 repeated plantings are necessary, then monitoring, maintenance, and annual reporting
49 shall continue for the subsequent three (3) years).

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Plant Type	# to be Removed	3:1 ratio required	70 % survival	# to be Planted
Goodding's willow (<i>Salix gooddingii</i>)	96	288	202	288
Narrow leafed willow (<i>Salix exigua</i>)	60	180	126	180
Oregon ash (<i>Fraxinus latifolia</i>)	6	18	13	40
Valley oak (<i>Quercus lobata</i>)	4	12	9	40
Button bush (<i>Cephalanthus occidentalis</i>)	26	78	55	146
Baltic rush (<i>Juncus balticus</i>)	30	90	63	90
Bog rush (<i>Juncus effusus</i> var <i>pacificus</i>)	20	60	42	75
Wormwood (<i>Artemisia douglasiana</i>)				342

- 1 Planting on-site shall be done the first appropriate season after the Project is complete.
2 Annual reports on survivorship, due January 31 each year, shall include photographs
3 taken from the same perspective before and after planting and each following year.

4

5 **MONITORING AND REPORTING PROGRAM (MRP):**

6

7 PURPOSE

8

9 The purpose of the MRP is to ensure that the protective measures required by the
10 Department are properly implemented, and to monitor the effectiveness of those
11 measures.

12

13 OBLIGATIONS OF THE OPERATOR

14

15 Caltrans shall have primary responsibility for monitoring compliance with all protective
16 measures included as "Provisions" in this Agreement. Protective measures must be
17 implemented within the time periods indicated in the Agreement and the program
18 described below.

19

20 Caltrans shall submit the following Reports to the Department:

21

- 22 • Verification of employee training (Provision 2).
- 23
- 24 • Construction/work schedule (Provision 3).
- 25
- 26 • Wildlife survey results (Provisions 6 through 11).
- 27
- 28 • Revegetation Plan (Provision 14 and 25). Plan shall be implemented for a
29 minimum of three (3) years with annual reports on survivorship due January 31

1 each year until the minimum of 70 percent survivorship has been achieved, at
2 which time a Final Restoration Report shall be submitted.

- 3
- 4 • A Final Project Report submitted within 30 days after the Project is completed.
5 The final report shall summarize the Project construction, including any problems
6 relating to the protective measures of this Agreement. "Before and After" photo
7 documentation of the Project site shall be required and included in the final report.
8

9 In addition to the above monitoring and reporting requirements, the Department
10 requires as part of this MRP that Caltrans:

- 11
- 12 • Immediately notify the Department in writing if monitoring reveals that any of the
13 protective measures were not implemented during the period indicated in this
14 program, or if it anticipates that measures will not be implemented within the time
15 period specified.
16
 - 17 • Immediately notify the Department if any of the protective measures are not
18 providing the level of protection that is appropriate for the impact that is occurring,
19 and recommendations, if any, for alternative protective measures.
20

21 **VERIFICATION OF COMPLIANCE:**

22

23 The Department shall verify compliance with protective measures to ensure the
24 accuracy of Caltrans' monitoring and reporting efforts. The Department may, at its sole
25 discretion, review relevant Project documents maintained by Caltrans, interview
26 Caltrans' employees and agents, inspect the Project area, and take other actions to
27 assess compliance with or effectiveness of protective measures for the Project.

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CONCURRENCE:

APPROVED BY THE CALIFORNIA DEPARTMENT OF FISH AND GAME

on 7/14/2009, 2009.

for 

Jeffrey R. Single, Ph.D.
Regional Manager
Central Region

ACKNOWLEDGMENT

The undersigned acknowledges receipt of this Agreement and, by signing, accepts and agrees to comply with all terms and conditions contained herein. The undersigned also acknowledges that adequate funding shall be made available to implement the measures required by this Agreement.

By: 

Zachary Parker
California Department of Transportation

Date: 7/3/2009



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

July 31, 2009

Regulatory Division (SPK-2004-00457)

Mr. Zachary K Parker, Chief
Central Region Biology Branch
State of California
Department of Transportation
2015 East Shields Avenue, Suite A-100
Fresno, California, 93726-5428

Dear Mr. Parker:

We are responding to your May 4, 2009 request for a Department of the Army permit for the State Route 99 (SR 99) Goshen to Kingsburg 6-Lane project. This approximately 13.6-mile long project involves activities, including the discharge of dredged or fill material, into waters of the United States to add additional lanes on SR 99. The project is located on SR 99 between the cities of Goshen and Kingsburg. The 353-acre site encompasses approximately 105 feet along either side of centerline and is located within portions of Sections 6, 5, 8, 11, 12, 13, 16, 17, 21, 22, 27, 26, 31, 34, 35, and 36, Townships 16, 17, and 18 South, Ranges 22 and 23 East, MDB&M Survey, Tulare and Fresno Counties, California.

Based on the information you provided, the proposed activity in approximately 2.818-acres of waters of the United States is authorized by Nationwide Permit Number 14 (Linear Transportation Projects) and Nationwide Permit Number 33 (Temporary Construction, Access, and Dewatering). The proposed impacts associated with this work include; approximately 0.216-acre of permanent impacts and 2.602-acres of temporary impacts to waters of the United States. Your work must comply with the general terms and conditions listed on the enclosed Nationwide Permit information sheets and the following special conditions:

1. To mitigate for the permanent loss of 0.216-acre of waters of the United States, you shall submit a check in the amount of \$32,400.00 payable to the National Fish and Wildlife Foundation (NFWF). The Tulare-Buena Vista Lakes Hydrologic Unit Code (18030012) must be indicated in the in-lieu fee agreement in order to insure the proper location of future mitigation. Prior to proceeding with any activity otherwise authorized by this permit, we must receive notification from you that your in-lieu fees have been deposited into NFWF's Sacramento District Wetlands Conservation Fund.

2. To mitigate for temporary impacts to the aquatic resource and associated habitat, you shall plant and maintain regionally appropriate native riparian vegetation at a 3:1 replacement ratio along the affected reach of the Kings River, Cross Creek and North Fork Cross Creek. Willows, oaks, alders, cottonwoods, sycamores, and/or other appropriate native vegetation shall be planted to shade the impacted areas. Rip-rapped areas must also be planted with native

vegetation, using the enclosed vegetated rip-rap techniques, or other appropriate methods, to insure long-term survival of plantings.

3. To ensure mitigation success, survivorship of the total planted native riparian vegetation within the on-site re-establishment areas shall reach 75% or greater. You shall monitor the on-site re-establishment areas for three years or until the success criterion above is met, whichever is greater. This period shall commence upon completion of the authorized fill activity, but not later than one year after the initiation of fill activity. You shall submit a monitoring report to this office at the end of the three-year monitoring period or once the success criterion has been met.

4. To ensure mitigation compliance, continued success of the re-establishment areas, without human intervention, must be demonstrated for three consecutive years, once the success criteria have been met. The mitigation will not be deemed successful until this criterion has been met. A final monitoring report shall be submitted at the end of the three year period demonstrating successful re-establishment of vegetation without human intervention. The primary focus of this monitoring shall be to assure that the temporary impact areas are successfully restored and maintained as riparian habitat and that the integrity of water quality is maintained.

5. Your responsibility to complete the required compensatory mitigation as set forth in Special Condition 2 will not be considered fulfilled until you have demonstrated mitigation success and have received written verification from the U.S. Army Corps of Engineers.

6. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register.

7. To mitigate project impacts to the aquatic resources and associated habitats, you shall employ protective mats or other barriers under heavy equipment, while operating in wetlands, mudflats, and vernal pools. You shall implement all measures necessary, in order to protect the topography, hydrology, and vegetation in these aquatic habitats.

8. This Corps permit does not authorize you to take an endangered species, in particular San Joaquin kit fox (*Vulpes macrotis mutica*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), or designated critical habitat. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (e.g., an Endangered Species Act Section 10 permit, or a Biological Opinion under Endangered Species Act Section 7, with "incidental take" provisions with which you must comply). The enclosed Fish and Wildlife Service Biological Opinion (Number 1-1-05-F-0040, dated June 23, 2005), contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the Biological Opinion. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with "incidental take" of the attached Biological Opinion, which terms and

conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the Biological Opinion, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The Fish and Wildlife Service is the appropriate authority to determine compliance with the terms and conditions of its Biological Opinion, and with the Endangered Species Act. The permittee must comply with all conditions of this Biological Opinion, including those ascribed to the Corps.

9. You shall follow the specifications and standards described in the Storm Water Pollution Prevention Plan (SWPPP) and/or Water Pollution Control Plan (WPCP), to prevent erosion and sedimentation during and after construction. Construction work within potential waters of the United States and associated wetlands shall be conducted during periods of low flow (typically June 1-October 30), outside the rainy season work window.

10. You shall employ Best Management Practices (BMP's) to avoid and minimize environmental impacts. Temporary fills, including those used to build construction haul roads, must be removed in their entirety and the affected areas returned to preconstruction elevations and conditions. The affected areas must be re-vegetated with a weed-free native seed mix.

11. You shall design and construct all crossings of waters of the United States to retain a natural substrate, and to accommodate all reasonably foreseeable expected high flows. Examples of crossings over or through waters of the United States include box culverts, bridges, fords, causeways or overpasses.

12. Excavated materials shall only be placed in upland locations. The upland disposal site(s) should be carefully chosen to reduce impacts to the functions and values of the flora and fauna, and shall be revegetated with native plant species along with implementation of an appropriate weed management plan.

13. All equipment staging, including Temporary Construction Areas (TCA's), shall take place within approved areas within the project boundary. Prior to construction implementation, you shall ensure all equipment staging, TCA's, demolition and disposal, excavation, off pavement detours, and borrow and fill areas, have been evaluated under National Environmental Policy Act (NEPA), Section 401 and 404 of the Clean Water Act, Section 7 of the Endangered Species Act and Section 106 of the National Historical Preservation Act and all required permits have been obtained.

14. You must allow representatives from the Corps of Engineers to inspect the authorized activity and any avoidance areas at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

15. To document pre-and post-project construction conditions, you shall submit numbered and dated photos of the waters (including both the temporary and permanently impacted areas) within the project site prior to project implementation and post-construction photos of the same areas within 30 days after project completion.

16. To prevent unauthorized fills and unforeseen impacts, you shall, prior to proceeding with any activity otherwise authorized by this permit, install high-visibility fencing and appropriate signage around the entire perimeter of avoided waters of the U.S. within the project area. All fencing surrounding avoidance areas shall allow unrestricted visibility of these areas to discourage vandalism, destruction or disturbance.

17. All terms and conditions of the June 17, 2009 Section 401 Water Quality Certification are expressly incorporated as conditions of this permit.

18. You must sign the enclosed Compliance Certification and return it to this office within 30 days after completion of the authorized work.

This verification is valid for two years from the date of this letter or until the Nationwide Permit is modified, reissued, or revoked, whichever comes first. Failure to comply with the General Conditions of this Nationwide Permit, or the project-specific Special Conditions of this authorization, may result in the suspension or revocation of your authorization.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website at: <http://per2.nwp.usace.army.mil/survey.html>.

Please refer to identification number SPK-2004-00457 in any correspondence concerning this project. If you have any questions, please contact Ms. Leah Fisher at our California North Branch Office, 1325 J Street, Room 1480, Sacramento, California 95814-2922 email leah.m.fisher@usace.army.mil, or telephone 916-557-6639. You may also use our website: www.spk.usace.army.mil/regulatory.html.

Sincerely,

Handwritten signature of Paul Manigault in cursive script.

Nancy A. Haley
Chief, California North Branch

Enclosures

Copy Furnished without enclosures:

Ms. Susan Jones, Chief, San Joaquin Valley Branch, Endangered Species Division, U.S. Fish and Wildlife Service, 2800 Cottage Way, Sacramento, California 95825-3901

Ms. Sandy Morey, California Department of Fish and Game, 1701 Nimbus Road, Rancho Cordova, California 95670-4504

Mr. Bill Orme, Water Quality Certification Unit, State Water Resources Control Board, 1001 I Street, Sacramento, California 95814-2828

COMPLIANCE CERTIFICATION

Permit File Number: SPK-2004-00457, SR99 Goshen to Kingsburg Project

Nationwide Permit Number: 14, Linear Transportation Projects and 33, Temporary Construction, Access, and Dewatering.

Permittee:

Mr. Zachary K Parker, Chief
Central Region Biology Branch
State of California
Department of Transportation
2015 East Shields Avenue, Suite A-100
Fresno, California, 93726-5428

County: Fresno and Tulare

Date of Verification: July 31, 2009

Within 30 days after completion of the activity authorized by this permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Regulatory Division
California North Branch
1325 J Street, Room 1480, Sacramento, California
FAX 916-557-6877

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with the terms and conditions of the permit your authorization may be suspended, modified, or revoked. If you have any questions about this certification, please contact the Corps of Engineers.

* * * * *

I hereby certify that the work authorized by the above-referenced permit, including all the required mitigation, was completed in accordance with the terms and conditions of the permit verification.

Signature of Permittee

Date



United States Department of the Interior



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

In reply refer to:
1-I-05-F-0040

JUN 23 2005

Mr. Gene K. Fong
Federal Highway Administration
U.S. Department of Transportation
650 Capitol Mall Room 4-100
Sacramento, California 95814

Subject: Biological Opinion on the State Route 99 Goshen to Kingsburg Six-Lane Project, Fresno and Tulare Counties, California

Dear Mr. Fong:

This responds to your December 15, 2004, request for formal consultation with the U.S. Fish and Wildlife Service (Service) regarding the proposed upgrade of State Route (SR) 99 in Fresno and Tulare Counties, California. Your request for formal consultation was received in our office on December 16, 2004. This document represents the Service's biological opinion on the effects of the proposed action on the endangered San Joaquin kit fox (*Vulpes macrotis mutica*), and the threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). This biological opinion was prepared in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act)

We have also reviewed the project's effects on the threatened vernal pool fairy shrimp (*Branchinecta lynchi*), the endangered vernal pool tadpole shrimp (*Lepidurus packardii*), and the threatened California tiger salamander (*Ambystoma californiense*). After two wet season surveys, vernal pool fairy shrimp and vernal pool tadpole shrimp were not observed in the seasonal pool within the action area. Surveys for the California tiger salamander also resulted in negative results. Although the pool is within designated critical habitat for the shrimp and proposed critical habitat for the salamander, the primary constituent elements (PCEs) are not present at this site. The critical habitat within the action area does not remain inundated for a sufficient amount of time to support the shrimp species, and the pool is within the right-of-way, isolated from other such pools. We conclude that the proposed project is not likely to adversely affect the vernal pool tadpole shrimp, the vernal pool fairy shrimp, or the California tiger salamander, or their designated/proposed critical habitat. These species and their corresponding critical habitat will not be discussed in the remainder of this biological opinion.

TAKE PRIDE
IN AMERICA

This biological opinion is based on information provided in the following documents: (1) *Goshen to Kingsburg Six-Lane Project Biological Assessment* prepared by Geoffrey Gray (Caltrans) and dated November 2004; (2) *Recovery Plan for Upland Species of the San Joaquin Valley, California* (Recovery Plan), prepared by the Service, and dated September 30, 1998; and (3) other information available to the Service.

Consultation History

- July 18, 2000: Telephone conversation between Susan Jones (Service) and Caltrans. Ms. Jones indicated that the land use of the project region indicates potential for San Joaquin kit fox presence, and that the Service determines impacts to the kit fox more at the habitat level rather than relying solely on survey data.
- August 15, 2003: Service receives project information in order to supply technical assistance on potential project effects to kit foxes.
- December 16, 2004: Request for formal consultation and Biological Assessment dated November 2004, received from Federal Highway Administration (FHWA).

BIOLOGICAL OPINION

Description of Proposed Action

The proposed project is located on SR 99 between the cities of Goshen and Kingsburg in Fresno and Tulare counties. SR 99 is a high-volume freeway connecting the San Joaquin Valley with the remainder of the state. The action area, including both temporary and permanent construction impacts, would occur within the existing Caltrans right-of-way, except between Dodge and Mendocino Avenues. Due to inadequate existing median width, new right-of-way (3 66 acres) will be acquired to the west of the current alignment in the vicinity of the Kings River.

Caltrans, in cooperation with FHWA, proposes to add two lanes, standard inside shoulders, and a median barrier alternating between concrete and metal thrie-beam guardrail, to the existing median of SR 99 in order to upgrade SR 99 to six lanes between Goshen and Kingsburg in Fresno and Tulare counties. The total length of the project is 13.6 miles, and the project is expected to begin in 2010. Two asphalt concrete lanes will be constructed in the median against the existing number one lanes, resulting in a total of six lanes. The northbound Kings River Bridge would be widened in place, but the southbound Kings River Bridge would be removed and replaced with a wider structure. Both bridges would be joined together into one six-lane bridge. The project also includes modification of all other SR 99 mainline bridges and culverts within the project limits to accommodate the widened freeway and the changes in the median,

including the widening of the Cross Creek Bridges. Many of the outside shoulders of existing SR 99 would be widened up to 2 feet to comply with current shoulder width standards.

The northern end of the action area, between Conejo and Mendocino Avenues, occurs within developed areas of Kingsburg. South of Mendocino Avenue, the action area lies within a region of the San Joaquin Valley floor predominated by agricultural lands that are plowed, leveled, and flood-irrigated for the production of food and fiber. Land within the action area includes highly disturbed ruderal areas on the median and shoulders interspersed with large ornamental trees and shrubs. The Kings River and Cross Creek flow through the action area toward the west. All construction work in the Cross Creek area would be limited to the existing right-of-way. The Kings River contains variable flows, depending on precipitation levels and irrigation needs, but can be dry during portions of the year. Riparian vegetation occurs along the banks. Cross Creek is an intermittent waterway with steep, eroded banks. It transports precipitation flow during the winter and irrigation water during the summer. However, at certain times during the year, the channel is dry. Sparse vegetation occurs on its banks. A small seasonal tributary to Cross Creek occurs north of the Cross Creek main channel. The tributary is often dry, but can carry some precipitation runoff during the wet months and irrigation tail water during the summer. No riparian vegetation occurs along its banks. Several overflow channels cross SR 99 south of the Cross Creek main channel. However, these overflow channels typically do not carry water as evidenced by the lack of a distinct bed, bank, and channel, and dense vegetation dominated by upland species. Water may occur in these overflow channels only during extreme precipitation events, during which flows would be rapid.

The proposed project includes the following conservation measures:

1. Preconstruction surveys prior to ground disturbance to search for kit fox dens within or adjacent to the action area will be conducted. Project actions likely to result in the incidental take of kit foxes will cease immediately, and the Service shall be contacted immediately for further guidance.
2. Existing bridges and box culverts, including four key undercrossings near Cross Creek, would remain in-place, allowing kit foxes to cross under SR 99.
3. The proposed median barrier between the McClanahan Ditch and the North Goshen Overcrossing (approximately 10.6 miles) would alternate between concrete and metal thrie-beam guardrail rather than solid concrete, in order to allow kit foxes and other wildlife passage across the SR 99 median. However, the vast majority of the median barrier would consist of metal thrie-beam (approximately 85% near Cross Creek).
4. Right-of-way fences between the McClanahan Ditch and the North Goshen Overhead would be designed to allow for kit fox and other wildlife passage.

5. Two elderberry shrubs (*Sambucus* spp.) will be designated as an environmentally sensitive area, and avoided by a minimum of 10 feet from the edge of the shrub canopy drip line. No soil excavation will occur within 20 feet of the shrubs' driplines. No earthen fill or soil compaction will proceed within 10 feet of the shrubs' driplines.
6. Seven elderberry shrubs will be transplanted, and elderberry seedlings and associated native plants in an appropriate-sized mitigation area will be established, according to the Service's 1999 *Conservation Guidelines for the Valley Elderberry Longhorn Beetle*. Since the project is not expected to begin until 2010, the compensation ratios are calculated based on projected numbers of stems expected to be taken. As a result, Caltrans may plant up to 111 elderberry seedlings and 103 associated native plant species.
7. All construction work in the Cross Creek area will be limited to the existing right-of-way to avoid effects to vernal pool species and the California tiger salamander.

Status of the Species

San Joaquin Kit Fox

The San Joaquin kit fox was listed as an endangered species on March 11, 1967 (Service 1967) and was listed by the State of California as a threatened species on June 27, 1971. The Recovery Plan includes this canine.

In the San Joaquin Valley before 1930, the range of the San Joaquin kit fox extended from southern Kern County north to Tracy, San Joaquin County, on the west side, and near La Grange, Stanislaus County, on the east side (Grinnell *et al.* 1937). Historically, this species occurred in several San Joaquin Valley native plant communities. In the southernmost portion of the range, these communities included Valley Sink Scrub, Valley Saltbrush Scrub, Upper Sonoran Subshrub Scrub, and Annual Grassland. San Joaquin kit foxes also exhibit a capacity to utilize habitats that have been altered by humans. The animals are present in many oil fields, grazed pasturelands, and "wind farms" (Cypher 2000). Kit foxes can inhabit the margins and fallow lands near irrigated row crops, orchards, and vineyards, and may forage occasionally in these agricultural areas. The San Joaquin kit fox seems to prefer more gentle terrain and decreases in abundance as terrain ruggedness increases (Grinnell *et al.* 1937; Morrell 1972; Warrick and Cypher 1998).

The kit fox is often associated with open grasslands, which form large contiguous blocks within the eastern portions of the range of the animal. The listed canine also utilizes oak savanna and some types of agriculture (e.g. orchards and alfalfa), although the long-term suitability of these habitats is unknown (Jensen 1972). In eastern Merced County, the lands between the urban corridor along Highway 99 and the open grasslands to the east are a mixture of orchards and annual crops, mostly alfalfa. Orchards occur in large contiguous blocks in the northwest portions of the study area and at scattered locations in the southwest portions. Orchards sometimes

support prey species if the grounds are not manicured; however, denning potential is typically low and kit foxes can be more susceptible to coyote predation within the orchards (Orloff 2000). Alfalfa fields provide an excellent prey base (Woodbridge 1987; Young 1989), and berms adjacent to alfalfa fields sometimes provide good denning habitat (Orloff 2000). Kit foxes often den adjacent to, and forage within, agricultural areas (Bell 1994). Although agricultural areas are not traditional kit fox habitat and are often highly fragmented, they can offer sufficient prey resources and denning potential to support small numbers of kit foxes.

Adult San Joaquin kit foxes are usually solitary during late summer and fall. In September and October, adult females begin to excavate and enlarge natal dens (Morrell 1972), and adult males join the females in October or November (Morrell 1972). Typically, pups are born between February and late March following a gestation period of 49 to 55 days (Egoscue 1962; Morrell 1972; Spiegel and Tom 1996). Mean litter sizes reported for San Joaquin kit foxes include 2.0 on the Carrizo Plain (White and Ralls 1993), 3.0 at Camp Roberts (Spencer *et al.* 1992), 3.7 in the Lokern area (Spiegel and Tom 1996), and 3.8 at the Naval Petroleum Reserve (Cypher *et al.* 2000). Pups appear above ground at about age 3-4 weeks, and are weaned at age 6-8 weeks. Reproductive rates, the proportion of females bearing young, of adult San Joaquin kit foxes vary annually with environmental conditions, particularly food availability. Annual rates range from 0-100%, and reported mean rates include 61% at the Naval Petroleum Reserve (Cypher *et al.* 2000), 64% in the Lokern area (Spiegel and Tom 1996), and 32% at Camp Roberts (Spencer *et al.* 1992). Although some yearling female kit foxes will produce young, most do not reproduce until age 2 years (Spencer *et al.* 1992; Spiegel and Tom 1996; Cypher *et al.* 2000). Some young of both sexes, but particularly females may delay dispersal, and may assist their parents in raising in the following year's litter of pups (Spiegel and Tom 1996). The young kit foxes begin to forage for themselves at about four to five months of age (Koopman *et al.* 2000; Morell 1972).

Although most young kit foxes disperse less than 8 kilometers (5 miles) (Scrivner *et al.* 1987), dispersal distances of up to 122 kilometers (76.3 miles) have been documented for the San Joaquin kit fox (Scrivner *et al.* 1993). Dispersal can be through disturbed habitats, including agricultural fields, and across highways and aqueducts. The age at dispersal ranges from 4-32 months (Cypher 2000). Among juvenile kit foxes surviving to July 1 at the Naval Petroleum Reserve, 49% of the males dispersed from natal home ranges while 24% of the females dispersed (Koopman *et al.* 2000). Among dispersing kit foxes, 87% did so during their first year of age. Most, 65.2%, of the dispersing juveniles at the Naval petroleum reserve died within 10 days of leaving their natal home den (Koopman *et al.* 2000). Some kit foxes delay dispersal and may inherit their natal home range.

Kit foxes are reputed to be poor diggers, and their dens are usually located in areas with loose-textured, friable soils (Morrell 1972; O'Farrell 1984). However, the depth and complexity of their dens suggest that they possess good digging abilities, and kit fox dens have been observed on a variety of soil types. Some studies have suggested that where hardpan layers predominate, kit foxes create their dens by enlarging the burrows of California ground squirrels (*Spermophilus beecheyi*) or badgers (*Taxidea taxus*) (Jensen 1972; Morrell 1972; Orloff *et al.* 1986). In parts of

their range, particularly in the foothills, kit foxes often use ground squirrel burrows for dens (Orloff *et al.* 1986). Kit fox dens are commonly located on flat terrain or on the lower slopes of hills. About 77 percent of all kit fox dens are at or below midslope (O'Farrell 1984), with the average slope at den sites ranging from 0 to 22 degrees (California Department of Fish and Game 1980; O'Farrell 1984; Orloff *et al.* 1986). Natal and pupping dens are generally found in flatter terrain. Common locations for dens include washes, drainages, and roadside berms. Kit foxes also commonly den in human-made structures such as culverts and pipes (O'Farrell 1984; Spiegel 1996).

Natal and pupping dens may include from two to 18 entrances and are usually larger than dens that are not used for reproduction (O'Farrell *et al.* 1980; O'Farrell and McCue 1981). Natal dens may be reused in subsequent years (Egoscue 1962). It has been speculated that natal dens are located in the same location as ancestral breeding sites (O'Farrell 1984). Active natal dens are generally 1.9 to 3.2 kilometers (1.2 to 2 miles) from the dens of other mated kit fox pairs (Egoscue 1962; O'Farrell and Gilbertson 1979). Natal and pupping dens usually can be identified by the presence of scat, prey remains, matted vegetation, and mounds of excavated soil (i.e. ramps) outside the dens (O'Farrell 1984). However, some active dens in areas outside the valley floor often do not show evidence of use (Orloff *et al.* 1986). During telemetry studies of kit foxes in the northern portion of their range, 70 percent of the dens that were known to be active showed no sign of use (e.g., tracks, scats, ramps, or prey remains) (Orloff *et al.* 1986). In another more recent study in the Coast Range, 79 percent of active kit fox dens lacked evidence of recent use other than signs of recent excavation (Jones and Stokes Associates 1997).

A kit fox can use more than 100 dens throughout its home range, although on average, an animal will use approximately 12 dens a year for shelter and escape cover (Cypher *et al.* 2000). Kit foxes typically use individual dens for only brief periods, often for only one day before moving to another den (Ralls *et al.* 1990). Possible reasons for changing dens include infestation by ectoparasites, local depletion of prey, or avoidance of coyotes (*Canis latrans*). Kit foxes tend to use dens that are located in the same general area, and clusters of dens can be surrounded by hundreds of hectares of similar habitat devoid of other dens (Egoscue 1962). In the southern San Joaquin Valley, kit foxes were found to use up to 39 dens within a denning range of 129 to 195 hectares (320 to 482 acres) (Morrell 1972). An average den density of one den per 28 to 37 hectares (69 to 92 acres) was reported by O'Farrell (1984) in the southern San Joaquin Valley.

Dens are used by kit foxes for temperature regulation, shelter from adverse environmental conditions, and escape from predators. Kit foxes excavate their own dens, use those constructed by other animals, and use human-made structures (culverts, abandoned pipelines, and banks in sumps or roadbeds). Kit foxes often change dens and may use many dens throughout the year; however, evidence that a den is being used by kit foxes may be absent. San Joaquin kit foxes have multiple dens within their home range and individual animals have been reported to use up to 70 different dens (Hall 1983). At the Naval Petroleum Reserve, individual kit foxes used an average of 11.8 dens per year (Koopman *et al.* 1998). Den switching by the San Joaquin kit fox

may be a function of predator avoidance, local food availability, or external parasite infestations (e.g., fleas) in dens (Egoscue 1956).

The diet of the San Joaquin kit fox varies geographically, seasonally, and annually, based on temporal and spatial variation in abundance of potential prey. In the portion of their geographic range that includes Merced County, known prey species of the kit fox include white-footed mice (*Peromyscus* spp.), insects, California ground squirrels, kangaroo rats (*Dipodomys* spp.), San Joaquin antelope squirrels, black-tailed hares (*Lepus californicus*), and chukar (*Alectoris chukar*) (Jensen 1972, Archon 1992), listed in approximate proportion of occurrence in fecal samples. Kit foxes also prey on desert cottontails (*Sylvilagus audubonii*), ground-nesting birds, and pocket mice (*Perognathus* spp.).

The diets and habitats selected by coyotes and kit foxes living in the same areas are often quite similar. Hence, the potential for resource competition between these species may be quite high when prey resources are scarce such as during droughts, which are quite common in semi-arid, central California. Competition for resources between coyotes and kit foxes may result in kit fox mortalities. Coyote-related injuries accounted for 50-87 per cent of the mortalities of radio collared kit foxes at Camp Roberts, the Carrizo Plain Natural Area, the Lokern Natural Area, and the Naval Petroleum Reserves (Cypher and Scrivner 1992; Standley *et al* 1992).

San Joaquin kit foxes are primarily nocturnal, although individuals are occasionally observed resting or playing (mostly pups) near their dens during the day (Grinnell *et al* 1937). Kit foxes occupy home ranges that vary in size from 1.7 to 4.5 square miles (White and Ralls 1993). A mated pair of kit foxes and their current litter of pups usually occupy each home range. Other adults, usually offspring from previous litters, also may be present (Koopman *et al* 2000), but individuals often move independently within their home range (Cypher 2000). Average distances traveled each night range from 5.8 to 9.1 miles and are greatest during the breeding season (Cypher 2000).

Kit foxes maintain core home range areas that are exclusive to mated pairs and their offspring (White and Ralls 1993, Spiegel 1996, White and Garrott 1997). This territorial spacing behavior eventually limits the number of foxes that can inhabit an area owing to shortages of available space and per capita prey. Hence, as habitat is fragmented or destroyed, the carrying capacity of an area is reduced and a larger proportion of the population is forced to disperse. Increased dispersal generally leads to lower survival rates and, in turn, decreased abundance because greater than 65 percent of dispersing juvenile foxes die within 10 days of leaving their natal range (Koopman *et al* 2000).

Estimates of fox density vary greatly throughout its range, and have been reported as high as 1.2 animals per square kilometer (3.11 per square miles) in optimal habitats in good years. At the Elk Hills in Kern County, density estimates varied from 0.7 animals per square kilometer (1.86 animals per square mile) in the early 1980s to 0.01 animals per square kilometer (0.03 animals per square mile) in 1991. Kit fox home ranges vary in size from approximately 2.6 square

kilometers to 31.2 square kilometers (1 to 12 square miles) (Spiegel 1996). Knapp (1978) estimated that a home range in agricultural areas is approximately 2.5 square kilometers (1 square mile). Individual home ranges overlap considerably, at least outside the core activity areas (Morrell 1972; Spiegel 1996).

Mean annual survival rates reported for adult San Joaquin kit foxes include 0.44 at the Naval Petroleum Reserve (Cypher *et al.* 2000), 0.53 at Camp Roberts (Standley *et al.* 1992), 0.56 at the Lokern area (Spiegel and Disney 1996), and 0.60 on the Carrizo Plain (Ralls and White 1995). However, survival rates widely vary among years (Spiegel and Disney 1996; Cypher *et al.* 2000). Mean survival rates for juvenile San Joaquin kit foxes (<1 year old) are lower than rates for adults. Survival to age 1 year was 0.14 at the Naval Petroleum Reserve (Cypher *et al.* 2000), 0.20 at Camp Roberts (Standley *et al.* 1992), and 0.21 on the Carrizo Plain (Ralls and White 1995). For both adults and juveniles, survival rates of males and females are similar. San Joaquin kit foxes may live to ten years in captivity (McGrew 1979) and 8 years in the wild (Berry *et al.* 1987), but most kit foxes do not live past 2-3 years of age.

The status (i.e., distribution, abundance) of the kit fox has decreased since its listing in 1967. This trend is reasonably certain to continue into the foreseeable future unless measures to protect, sustain, and restore suitable habitats, and alleviate other threats to their survival and recovery, are implemented. Threats that are seriously affecting kit foxes are described in further detail in the following paragraphs.

Loss of Habitat

Less than 20 percent of the habitat within the historical range of the kit fox remained when the subspecies was listed as federally-endangered in 1967, and there has been a substantial net loss of habitat since that time. Historically, San Joaquin kit foxes occurred throughout California's Central Valley and adjacent foothills. Extensive land conversions in the Central Valley began as early as the mid-1800s with the Arkansas Reclamation Act. By the 1930's, the range of the kit fox had been reduced to the southern and western parts of the San Joaquin Valley (Grinnell *et al.* 1937). The primary factor contributing to this restricted distribution was the conversion of native habitat to irrigated cropland, industrial uses (e.g., hydrocarbon extraction), and urbanization (Laughrin 1970; Jensen 1972; Morrell 1972, 1975). Approximately one-half of the natural communities in the San Joaquin Valley were tilled or developed by 1958 (Service 1980).

This rate of loss accelerated following the completion of the Central Valley Project and the State Water Project, which diverted and imported new water supplies for irrigated agriculture (Service 1995). Approximately 1.97 million acres of habitat, or about 66,000 acres per year, were converted in the San Joaquin region between 1950 and 1980 (California Department of Forestry and Fire Protection 1988). The counties specifically noted as having the highest wildland conversion rates included Kern, Tulare, Kings and Fresno, all of which are occupied by kit foxes. From 1959 to 1969 alone, an estimated 34 percent of natural lands were lost within the then-known kit fox range (Laughrin 1970).

By 1979, only approximately 370,000 acres out of a total of approximately 8.5 million acres on the San Joaquin Valley floor remained as non-developed land (Williams 1985, Service 1980). Data from the CDFG (1985) and Service file information indicate that between 1977 and 1988, essential habitat for the blunt-nosed leopard lizard, a species that occupies habitat that is also suitable for kit foxes, declined by about 80 percent – from 311,680 acres to 63,060 acres, an average of about 22,000 acres per year (Biological Opinion for the Interim Water Contract Renewal, Ref. No. 1-1-00-F-0056, February 29, 2000). Virtually all of the documented loss of essential habitat was the result of conversion to irrigated agriculture.

During 1990 to 1996, a gross total of approximately 71,500 acres of habitat were converted to farmland in 30 counties (total area 23.1 million acres) within the Conservation Program Focus area of the Central Valley Project. This figure includes 42,520 acres of grazing land and 28,854 acres of “other” land, which is predominantly comprised of native habitat. During this same time period, approximately 101,700 acres were converted to urban land use within the Conservation Program Focus area (California Department of Conservation 1994, 1996, 1998). This figure includes 49,705 acres of farmland, 20,476 acres of grazing land, and 31,366 acres of “other” land, which is predominantly comprised of native habitat. Because these assessments included a substantial portion of the Central Valley and adjacent foothills, they provide the best scientific and commercial information currently available regarding the patterns and trends of land conversion within the kit fox’s geographic range.

In summary, more than one million acres of suitable habitat for kit foxes have been converted to agricultural, municipal, or industrial uses since the listing of the kit fox. In contrast, less than 500,000 acres have been preserved or are subject to community-level conservation efforts designed, at least in part, to further the conservation of the kit fox.

Land conversions contribute to declines in kit fox abundance through direct and indirect mortalities, displacement, reduction of prey populations and denning sites, changes in the distribution and abundance of larger canids that compete with kit foxes for resources, and reductions in carrying capacity. Kit foxes may be buried in their dens during land conversion activities (C. Van Horn, Endangered Species Recovery Program, Bakersfield, personal communication to S. Jones, Fish and Wildlife Service, Sacramento, 2000), or permanently displaced from areas where structures are erected or the land is intensively irrigated (Jensen 1972, Morrell 1975). Furthermore, even moderate fragmentation or loss of habitat may significantly impact the abundance and distribution of kit foxes. Capture rates of kit foxes at the Naval Petroleum Reserve in Elk Hills were negatively associated with the extent of oil-field development after 1987 (Warrick and Cypher 1998). Likewise, the California Energy Commission found that the relative abundance of kit foxes was lower in oil-developed habitat than in nearby undeveloped habitat on the Lokern (Spiegel 1996). Researchers from both studies inferred that the most significant effect of oil development was the lowered carrying capacity for populations of both foxes and their prey species owing to the changes in habitat characteristics or the loss and fragmentation of habitat (Spiegel 1996, Warrick and Cypher 1998).

Dens are essential for the survival and reproduction of kit foxes that use them year-round for shelter and escape, and in the spring for rearing young. Hence, kit foxes generally have dozens of dens scattered throughout their territories. However, land conversion reduces the number of typical earthen dens available to kit foxes. For example, the average density of typical, earthen kit fox dens at the Naval Hills Petroleum Reserve was negatively correlated with the intensity of petroleum development (Zoellick *et al.* 1987), and almost 20 percent of the dens in developed areas were found to be in well casings, culverts, abandoned pipelines, oil well cellars, or in the banks of sumps or roads (Service 1983). These results are important because the California Energy Commission found that, even though kit foxes frequently used pipes and culverts as dens in oil-developed areas of western Kern County, only earthen dens were used to birth and wean pups (Spiegel 1996). Similarly, kit foxes in Bakersfield use atypical dens, but have only been found to rear pups in earthen dens (P. Kelly, Endangered Species Recovery Program, Fresno, personal communication to P. White, Fish and Wildlife Service, Sacramento, April 6, 2000). Hence, the fragmentation of habitat and destruction of earthen dens could adversely affect the reproductive success of kit foxes. Furthermore, the destruction of earthen dens may also affect kit fox survival by reducing the number and distribution of escape refuges from predators. Land conversions and associated human activities can lead to widespread changes in the availability and composition of mammalian prey for kit foxes. For example, oil field disturbances in western Kern County have resulted in shifts in the small mammal community from the primarily granivorous species that are the staple prey of kit foxes (Spiegel 1996), to species adapted to early successional stages and disturbed areas (e.g., California ground squirrels) (Spiegel 1996). Because more than 70 percent of the diets of kit foxes usually consist of abundant leporids (*Lepus*, *Sylvilagus*) and rodents (e.g., *Dipodomys* spp.), and kit foxes often continue to feed on their staple prey during ephemeral periods of prey scarcity, such changes in the availability and selection of foraging sites by kit foxes could influence their reproductive rates, which are strongly influenced by food supply and decrease during periods of prey scarcity (White and Garrott 1997, 1999).

Extensive habitat destruction and fragmentation have contributed to smaller, more-isolated populations of kit foxes. Small populations have a higher probability of extinction than larger populations because their low abundance renders them susceptible to stochastic (i.e., random) events such as high variability in age and sex ratios, and catastrophes such as floods, droughts, or disease epidemics (Lande 1988, Frankham and Ralls 1998, Saccheri *et al.* 1998). Similarly, isolated populations are more susceptible to extirpation by accidental or natural catastrophes because their recolonization has been hampered. These chance events can adversely affect small, isolated populations with devastating results. Extirpation can even occur when the members of a small population are healthy, because whether the population increases or decreases in size is less dependent on the age-specific probabilities of survival and reproduction than on raw chance (sampling probabilities). Owing to the probabilistic nature of extinction, many small populations will eventually lose out and go extinct when faced with these stochastic risks (Caughley and Gunn 1995).

Oil fields in the southern half of the San Joaquin Valley also continue to be an area of expansion and development activity. This expansion is reasonably certain to increase in the near future owing to market-driven increases in the price of oil. The cumulative and long-term effects of oil extraction activities on kit fox populations are not fully known, but recent studies indicate that moderate- to high-density oil fields may contribute to a decrease in carrying capacity for kit foxes owing to habitat loss or changes in habitat characteristics (Spiegel 1996, Warrick and Cypher 1998). There are no limiting factors or regulations that are likely to retard the development of additional oil fields. Hence, it is reasonably certain that development will continue to destroy and fragment kit fox habitat into the foreseeable future.

Competitive Interactions with Other Canids

Several species prey upon San Joaquin kit foxes. Predators (such as coyotes, bobcats, non-native red foxes, badgers (*Taxidea taxus*), and golden eagles, *Aquila chrysaetos*) will kill kit foxes. Badgers, coyotes, and red foxes also may compete for den sites. The diets and habitats selected by coyotes and kit foxes living in the same areas are often quite similar (Cypher and Spencer 1998). Hence, the potential for resource competition between these species may be quite high when prey resources are scarce such as during droughts (which are quite common in semi-arid, central California). Land conversions and associated human activities have led to changes in the distribution and abundance of coyotes, which compete with kit foxes for resources.

Coyotes occur in most areas with abundant populations of kit foxes and, during the past few decades, coyote abundance has increased in many areas owing to a decrease in ranching operations, favorable landscape changes, and reduced control efforts (Orloff *et al.* 1986, Cypher and Scrivner 1992, White and Ralls 1993, White *et al.* 1995). Coyotes may attempt to lessen resource competition with kit foxes by killing them. Coyote-related injuries accounted for 50-87 percent of the mortalities of radio collared kit foxes at Camp Roberts, the Carrizo Plain Natural Area, the Lokern Natural Area, and the Naval Petroleum Reserves (Cypher and Scrivner 1992, Standley *et al.* 1992, Ralls and White 1995, Spiegel 1996). Coyote-related deaths of adult foxes appear to be largely additive (i.e., in addition to deaths caused by other mortality factors such as disease and starvation) rather than compensatory (i.e., tending to replace deaths due to other mortality factors; White and Garrott 1997). Hence, the survival rates of adult foxes decrease significantly as the proportion of mortalities caused by coyotes increase (Cypher and Spencer 1998, White and Garrott 1997), and increases in coyote abundance may contribute to significant declines in kit fox abundance (Cypher and Scrivner 1992, Ralls and White 1995, White *et al.* 1996). There is some evidence that the proportion of juvenile foxes killed by coyotes increases as fox density increases (White and Garrott 1999). This density-dependent relationship would provide a feedback mechanism that reduces the amplitude of kit fox population dynamics and keeps foxes at lower densities than they might otherwise attain. In other words, coyote-related mortalities may dampen or prevent fox population growth, and accentuate, hasten, or prolong population declines.

Land-use changes also contributed to the expansion of nonnative red foxes into areas inhabited by kit foxes. Historically, the geographic range of the red fox did not overlap with that of the San Joaquin kit fox. By the 1970's, however, introduced and escaped red foxes had established breeding populations in many areas inhabited by San Joaquin kit foxes (Lewis *et al.* 1993). The larger and more aggressive red foxes are known to kill kit foxes (Ralls and White 1995), and could displace them, as has been observed in the arctic when red foxes expanded into the ranges of smaller arctic foxes (Hersteinsson and Macdonald 1982). The increased abundance and distribution of nonnative red foxes will also likely adversely affect the status of kit foxes because they are closer morphologically and taxonomically, and would likely have higher dietary overlap than coyotes; potentially resulting in more intense competition for resources. Two documented deaths of kit foxes due to red foxes have been reported (Ralls and White 1995), and red foxes appear to be displacing kit foxes in the northwestern part of their range (Lewis *et al.* 1993). At Camp Roberts, red foxes have usurped several dens that were used by kit foxes during previous years (California Army National Guard, Camp Roberts Environmental Office, unpubl. data). In fact, opportunistic observations of red foxes in the cantonment area of Camp Roberts have increased 5-fold since 1993, and no kit foxes have been sighted or captured in this area since October 1997. Also, a telemetry study of sympatric red foxes and kit foxes in the Lost Hills area has detected spatial segregation between these species, suggesting that kit foxes may avoid or be excluded from red fox-inhabited areas (P. Kelly, Endangered Species Recovery Program, Fresno, pers. comm. to P. White, Fish and Wildlife Service, Sacramento, April 6, 2000). Such avoidance would limit the resources available to local populations of kit foxes and possibly result in decreased fox abundance and distribution.

Disease

Wildlife diseases do not appear to be a primary mortality factor that consistently limits kit fox populations throughout their range (McCue and O'Farrell 1988, Standley and McCue 1992). However, central California has a high incidence of wildlife rabies cases (Schultz and Barrett 1991), and high seroprevalences of canine distemper virus and canine parvovirus indicate that kit fox populations have been exposed to these diseases (McCue and O'Farrell 1988; Standley and McCue 1992). Hence, disease outbreaks could potentially cause substantial mortality or contribute to reduced fertility in seropositive females, as was noted in closely-related swift foxes (*Vulpes velox*).

For example, there are some indications that rabies virus may have contributed to a catastrophic decrease in kit fox abundance at Camp Roberts, San Luis Obispo County, California, during the early 1990's. San Luis Obispo County had the highest incidence of wildlife rabies cases in California during 1989 to 1991, and striped skunks (*Mephitis mephitis*) were the primary vector (Barrett 1990, Schultz and Barrett 1991, Reilly and Mangiamele 1992). A rabid skunk was trapped at Camp Roberts during 1989 and two foxes were found dead due to rabies in 1990 (Standley *et al.* 1992). Captures of kit foxes during annual live trapping sessions at Camp Roberts decreased from 103 to 20 individuals during 1988 to 1991. Captures of kit foxes were positively correlated with captures of skunks during 1988 to 1997; suggesting that some factor(s)

such as rabies virus was contributing to concurrent decreases in the abundances of these species. Also, captures of kit foxes at Camp Roberts were negatively correlated with the proportion of skunks that were rabid when trapped by County Public Health Department personnel two years previously. These data suggest that a rabies outbreak may have occurred in the skunk population and spread into the fox population. A similar time lag in disease transmission and subsequent population reductions was observed in Ontario, Canada, although in this instance the transmission was from red foxes to striped skunks (Macdonald and Voigt 1985).

Pesticides and Rodenticides

Pesticides and rodenticides pose a threat to kit foxes through direct or secondary poisoning. Kit foxes may be killed if they ingest rodenticide in a bait application, or if they eat a rodent that has consumed the bait. Even sublethal doses of rodenticides may lead to the death of these animals by impairing their ability to escape predators or find food. Pesticides and rodenticides may also indirectly affect the survival of kit foxes by reducing the abundances of their staple prey species.

For example, the California ground squirrel, which is the staple prey of kit foxes in the northern portion of their range, was thought to have been eliminated from Contra Costa County in 1975, after extensive rodent eradication programs. Field observations indicated that the long-term use of ground squirrel poisons in this county severely reduced kit fox abundance through secondary poisoning and the suppression of populations of its staple prey (Orloff *et al.* 1986).

Kit foxes occupying habitats adjacent to agricultural lands are also likely to come into contact with insecticides applied to crops owing to runoff or aerial drift. Kit foxes could be affected through direct contact with sprays and treated soils, or through consumption of contaminated prey. Data from the California Department of Pesticide Regulation indicate that acephate, aldicarb, azinphos methyl, bendiocarb, carbofuran, chlorpyrifos, endosulfan, s-fenvalerate, naled, parathion, permethrin, phorate, and trifluralin are used within one mile of kit fox habitat. A wide variety of crops (alfalfa, almonds, apples, apricots, asparagus, avocados, barley, beans, beets, bok choy, broccoli, cantaloupe, carrots, cauliflower, celery, cherries, chestnuts, chicory, Chinese cabbage, Chinese greens, Chinese radish, collards, corn, cotton, cucumbers, eggplants, endive, figs, garlic, grapefruit, grapes, hay, kale, kiwi fruit, kohlrabi, leeks, lemons, lettuce, melons, mustard, nectarines, oats, okra, olives, onions, oranges, parsley, parsnips, peaches, peanuts, pears, peas, pecans, peppers, persimmons, pimentos, pistachios, plums, pomegranates, potatoes, prunes, pumpkins, quinces, radishes, raspberries, rice, safflower, sorghum, spinach, squash, strawberries, sugar beets, sweet potatoes, Swiss chard, tomatoes, walnuts, watermelons, and wheat), as well as buildings, Christmas tree plantations, commercial/industrial areas, greenhouses, nurseries, landscape maintenance, ornamental turf, rangeland, rights of way, and uncultivated agricultural and non-agricultural land, occur in close proximity to San Joaquin kit fox habitat.

Efforts have been underway to reduce the risk of rodenticides to kit foxes (Service 1993). The Federal government began controlling the use of rodenticides in 1972 with a ban of Compound

1080 on Federal lands pursuant to Executive Order. Above-ground application of strychnine within the geographic ranges of listed species was prohibited in 1988. A July 28, 1992, biological opinion regarding the Animal Damage Control (now known as Wildlife Services) Program by the U.S. Department of Agriculture found that this program was likely to jeopardize the continued existence of the kit fox owing to the potential for rodent control activities to take the fox. As a result, several reasonable and prudent measures were implemented, including a ban on the use of M-44 devices, toxicants, and fumigants within the recognized occupied range of the kit fox. Also, the only chemical authorized for use by Wildlife Services within the occupied range of the kit fox was zinc phosphide, a compound known to be minimally toxic to kit foxes (Service 1993)

Despite these efforts, the use of other pesticides and rodenticides still pose a significant threat to the kit fox, as evidenced by the death of 2 kit foxes at Camp Roberts in 1992 owing to secondary poisoning from chlorophacinone applied as a rodenticide, (Berry *et al.* 1992, Standley *et al.* 1992). Also, the livers of 3 foxes that were recovered in the City of Bakersfield during 1999 were found to contain detectable residues of the anticoagulant rodenticides chlorophacinone, brodifacoum, and bromadiolone (California Department of Fish and Game 1999).

To date, no specific research has been conducted on the effects of different pesticide or rodent control programs on the kit fox. This lack of information is problematic because Williams (in lit., 1989) documented widespread pesticide use in known kit fox and Fresno kangaroo rat habitat adjoining agricultural lands in Madera County. In a separate report, Williams (in lit., 1989) documented another case of pesticide use near Raisin City, Fresno County, where treated grain was placed within an active Fresno kangaroo rat precinct. Also, farmers have been allowed to place bait on Bureau of Reclamation property to maximize the potential for killing rodents before they entered adjoining fields (Biological Opinion for the Interim Water Contract Renewal, Ref. No. 1-1-00-F-0056, February 29, 2000).

A September 22, 1993, biological opinion issued by the Service to the Environmental Protection Agency (EPA) regarding the regulation of pesticide use (31 registered chemicals) through administration of the Federal Insecticide, Fungicide, and Rodenticide Act found that use of the following chemicals would likely jeopardize the continued existence of the kit fox: (1) aluminum and magnesium phosphide fumigants; (2) chlorophacinone anticoagulants; (3) diphacinone anticoagulants; (4) pival anticoagulants; (5) potassium nitrate and sodium nitrate gas cartridges; and (6) sodium cyanide capsules (Service 1993). Reasonable and prudent alternatives to avoid jeopardy included restricting the use of aluminum/magnesium phosphide, potassium/sodium nitrate within the geographic range of the kit fox to qualified individuals, and prohibiting the use of chlorophacinone, diphacinone, pival, and sodium cyanide within the geographic range of the kit fox, with certain exceptions (e.g., agricultural areas that are greater than 1 mile from any kit fox habitat) (Service 1999).

Endangered Species Act Section 9 Violations and Noncompliance with the Terms and Conditions of Existing Biological Opinions

The intentional or unintentional destruction of areas occupied by kit foxes is an issue of serious concern. Section 9 of the Act prohibits the "take" (e.g., harm, harass, pursue, injure, kill) of federally-listed wildlife species. "Harm" (i.e., "take") is further defined to include habitat modification or degradation that kills or injures wildlife by impairing essential behavioral patterns including breeding, feeding, or sheltering. Congress established two provisions (under sections 7 and 10 of the Act) that allow for the "incidental take" of listed species of wildlife by Federal agencies, non-Federal government agencies, and private interests. Incidental take is defined as "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Such take requires a permit from the Secretary of the Interior that anticipates a specific level of take for each listed species. If no permit is obtained for the incidental take of listed species, the individuals or entities responsible for these actions could be liable under the enforcement provisions of potential section 9 of the Act if any unauthorized take occurs. There are numerous examples of section 9 violations and noncompliance with the terms and conditions of existing biological opinions on file at the Sacramento Fish and Wildlife Office. The most egregious violations, and those with the most evidence, are being pursued when Service Law Enforcement and California Department of Fish and Game Enforcement are able to do so

Risk of Chance Extinction Owing to Small Population Size, Isolation, and High Natural Fluctuations in Abundance

Historically, kit foxes may have existed in a metapopulation structure of core and satellite populations, some of which periodically experienced local extinctions and recolonization. Today's populations exist in an environment drastically different from the historic one, however, and extensive habitat fragmentation will result in geographic isolation, smaller population sizes, and reduced genetic exchange among populations; all of which increase the vulnerability of kit fox populations to extirpation. Populations of kit foxes are extremely susceptible to the risks associated with small population size and isolation because they are characterized by marked instability in population density. For example, the relative abundance of kit foxes at the Naval Petroleum Reserves, California, decreased 10-fold during 1981 to 1983, increased 7-fold during 1991 to 1994, and then decreased 2-fold during 1995 (Cypher and Scrivner 1992, Cypher and Spencer 1998).

Many populations of kit fox are at risk of chance extinction owing to small population size and isolation. This risk has been prominently illustrated during recent, drastic declines in the populations of kit foxes at Camp Roberts and Fort Hunter Liggett. Captures of kit foxes during annual live trapping sessions at Camp Roberts decreased from 103 to 20 individuals during 1988 to 1991. This decrease continued through 1997 when only three kit foxes were captured (White *et al.* 2000). A similar decrease in kit fox abundance occurred at nearby Fort Hunter Liggett, and only 2 kit foxes have been observed on this installation since 1995 (L. Clark, Wildlife Biologist, Fort Hunter Liggett, pers. comm. to P. White, Service, Sacramento, February 15, 2000). It is

unlikely that the current low abundances of kit foxes at Camp Roberts and Fort Hunter Liggett will increase substantially in the near future owing to the limited potential for recruitment. The chance of substantial immigration is low because the nearest core population on the Carrizo Plain is distant (greater than 16 miles) and separated from these installations by barriers to kit fox movement such as roads, developments, and irrigated agricultural areas. Also, there is a relatively high abundance of sympatric predators and competitors on these installations that contribute to low survival rates for kit foxes and, as a result, may limit population growth (White *et al.* 2000). Hence, these populations may be on the verge of extinction.

The destruction and fragmentation of habitat could also eventually lead to reduced genetic variation in populations of kit foxes that are small and geographically isolated. Historically, kit foxes likely existed in a metapopulation structure of core and satellite populations, some of which periodically experienced local extinctions and recolonization. Preliminary genetic assessments indicate that historic gene flow among populations was quite high, with effective dispersal rates of at least one to 4 dispersers per generation (M. Schwartz, University of Montana, Missoula, pers. comm. on March 23, 2000, to P. White, Service, Sacramento, California). This level of genetic dispersal should allow for local adaptation while preventing the loss of any rare alleles. Based on these results, it is likely that northern populations of kit foxes were once panmictic (i.e., randomly mating in a genetic sense), or nearly so, with southern populations. In other words, there were no major barriers to dispersal among populations.

Current levels of gene flow also appear to be adequate, however, extensive habitat loss and fragmentation continues to form more or less geographically distinct populations of foxes, which could potentially reduce genetic exchange among them. An increase in inbreeding and the loss of genetic variation could increase the extinction risk for small, isolated populations of kit foxes by interacting with demography to reduce fecundity, juvenile survival, and lifespan (Lande 1988, Frankham and Ralls 1998, Saccheri *et al.* 1998).

An area of particular concern is Santa Nella in western Merced County where pending development plans threaten to eliminate the little suitable habitat that remains and provides a dispersal corridor for kit foxes between the northern and southern portions of their range. Preliminary estimates of expected heterozygosity from foxes in this area indicate that this population may already have reduced genetic variation.

Other populations that may be showing the initial signs of genetic isolation are the Lost Hills area and populations in the Salinas-Pajaro River watershed (i.e., Camp Roberts and Fort Hunter Liggett). Preliminary estimates of the mean number of alleles per locus from foxes in these populations indicate that allelic diversity is lower than expected. Although these results may, in part, be due to the small number of foxes sampled in these areas, they may also be indicative of an increase in the amount of inbreeding due to population subdivision (M. Schwartz, University of Montana, Missoula, pers. comm. on March 23, 2000, to P. J. White, Fish and Wildlife Service, Sacramento, California). Further sampling and analyses are necessary to adequately assess the effects of these potential genetic bottlenecks.

Arid systems are characterized by unpredictable fluctuations in precipitation, which lead to high frequency, high amplitude fluctuations in the abundance of mammalian prey for kit foxes (Goldingay *et al.* 1997, White and Garrott 1999). Because the reproductive and neonatal survival rates of kit foxes are strongly depressed at low prey densities (White and Ralls 1993; White and Garrott 1997, 1999), periods of prey scarcity owing to drought or excessive rain events can contribute to population crashes and marked instability in the abundance and distribution of kit foxes (White and Garrott 1999). In other words, unpredictable, short-term fluctuations in precipitation and, in turn, prey abundance can generate frequent, rapid decreases in kit fox density that increase the extinction risk for small, isolated populations.

The primary goal of the recovery strategy for kit foxes identified in the Recovery Plan is to establish a complex of interconnected core and satellite populations throughout the species' range. The long-term viability of each of these core and satellite populations depends partly upon periodic dispersal and genetic flow between them. Therefore, kit fox movement corridors between these populations must be preserved and maintained. In the northern range, from the Ciervo Panoche in Fresno County northward, kit fox populations are small and isolated, and have exhibited significant decline. The core populations are the Ciervo Panoche area, the Carrizo Plain area, and the western Kern County population. Satellite populations are found in the urban Bakersfield area, Porterville/Lake Success area, Creighton Ranch/Pixley Wildlife Refuge, Allensworth Ecological Reserve, Semitropic/Kern National Wildlife Refuge (NWR), Antelope Plain, eastern Kern grasslands, Pleasant Valley, western Madera County, Santa Nella, Kesterson NWR, and Contra Costa County. Major corridors connecting these population areas are on the east and west side of the San Joaquin Valley, around the bottom of the Valley, and cross-valley corridors in Kern, Fresno, and Merced Counties.

In response to the drastic loss of habitat and steadily increasing fragmentation, Caltrans and the Service convened a San Joaquin Kit Fox Conservation and Planning Team to address the rapid decline of kit fox habitat in the northern range, and increasing barriers to kit fox dispersal. Consisting of Federal, State, and local agencies, local land trusts, environmental groups, researchers, and other concerned individuals, the goal of this team was to coordinate agency actions that will recover the species, and troubleshoot threats to San Joaquin kit foxes as they emerge. Between the years 2001-2003, the team addressed connectivity issues at specific points along the west-side corridor north of the Ciervo Panoche core population.

Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle was listed as a federally threatened species on August 8, 1980 (45 FR 52803). The beetle was first described in the early 1900's and was later determined to be endemic to moist valley oak woodlands along the margins of rivers and streams in the Sacramento and San Joaquin Valleys of California. Two areas along the American River in the Sacramento metropolitan area have been designated as critical habitat for the valley elderberry longhorn beetle (45 FR 52803). In addition, an area along Putah Creek, Solano County, and the area west of Nimbus Dam along the American River Parkway, Sacramento County, are

considered essential habitat (Service 1984). The beetle is facultatively dependent on its host plant, the elderberry, which is a locally common component of the remaining riparian forests and savannah areas and, to a lesser extent, the mixed chaparral-foothill woodlands of the Central Valley.

Adults are generally present on elderberry shrubs from March through June. During this period, the adults mate, and the females lay eggs on living elderberry plants. The female generally lays eggs either singularly, or in small groups, in crevices in the bark or at the junctures of stems and leaves along the trunk of the plant. Presumably, eggs hatch shortly after they are laid and the larvae bore into the pith of larger stems and roots where they remain until they mature. Just prior to the pupal stage, larvae open an emergence hole in the bark and then return to the pith to pupate. Use of the elderberry shrubs by the beetle is rarely apparent as the only exterior evidence of the shrub's use by the beetle is the "exit hole" created by the larvae just prior to the pupal stage. Larvae appear to be distributed primarily in elderberry stems that are one inch in diameter or greater at ground level.

Habitat destruction was the primary factor contributing to the need to federally list the beetle. Riparian forests, the primary habitat for the beetle, have been severely depleted throughout the Central Valley over the last two centuries (Katibah 1984; Thompson 1961; Roberts *et al.* 1977). The 1984 recovery plan attributed the loss and alteration of this riparian habitat to agricultural conversion, grazing, levee construction, stream and river channelization, removal of riparian vegetation, riprapping of shoreline, recreation, and industrial and urban development (Service 1984).

The beetle probably occurs naturally at low densities, with limited dispersal capability (Barr 1991; Collinge *et al.* 2001; Huxel 2000). This makes the beetle extremely vulnerable to the negative effects associated with habitat loss and fragmentation. Small, isolated subpopulations are susceptible to extirpation from random demographic, environmental, and/or genetic effects (Shaffer 1981; Lande 1988; Primack 1998). A large area of habitat may support a single large population, whereas smaller subpopulations result from habitat fragmentation and isolation. These subpopulations may tend to lose genetic variability through genetic drift. This generally leads to inbreeding depression and a lack of adaptive flexibility. Ultimately, these smaller populations are more vulnerable to random fluctuations in reproductive and mortality rates, and are more likely to be extirpated by random environmental factors. Barr (1991) found that small, isolated habitat remnants were less likely to be occupied by beetles than larger patches, indicating that beetle subpopulations are extirpated from small habitat fragments, or may be unable to recolonize isolated patches of habitat. Barr (1991) and Collinge *et al.* (2001) consistently found that beetle exit holes occurring in clumps of elderberry bushes rather than isolated bushes, suggesting that isolated shrubs do not typically provide long-term viable habitat for this species. Huxel (2000) used computer simulations of colonization and extinction patterns for the beetle, based on differing dispersal distances, and found that short dispersal simulations best matched census data in terms of site occupancy. This suggests that, in the natural system, dispersal, and thus colonization, is limited to nearby sites.

Habitat fragmentation not only isolates small populations, but it also increases the interface between habitat and urban or agricultural land, thereby increasing negative edge effects such as the invasion of nonnative species (Huxel 2000; Soule 1990) and pesticide contamination (Barr 1991). Recent evidence indicates that the invasive Argentine ant (*Linepithema humile*) poses a risk to the long-term survival of the beetle. Surveys along Putah Creek found beetle presence where Argentine ants were not present or had recently colonized, and beetle absence from otherwise suitable sites where Argentine ants had become established (Huxel 2000). The Argentine ant has been expanding its range throughout California since its introduction around 1907, especially in riparian woodlands associated with perennial streams (Holway 1995; Ward 1987). Huxel (2000) states that, given the potential for Argentine ants to spread with the aid of human activities such as movement of plant nursery stock and agricultural products, this species may come to infest most drainages in the Central Valley along the valley floor, where the beetle is found.

Direct spraying and pesticide drift in or near riparian areas is likely to adversely affect the beetle and its habitat. Pesticides have been identified as one of a number of potential causes of pollinator species' declines, and declines of other insects beneficial to agriculture (Ingraham *et al.* 1996). Although there have been no studies specifically focusing on the effects of pesticides on the beetle, it is likely that the beetle, typically occurring adjacent to agricultural lands, may have suffered pesticide-induced declines as well.

Overgrazing by livestock damages or destroys elderberry plants and inhibits regeneration of seedlings. Cattle readily forage on new growth of elderberry, which may explain the absence of beetles at manicured elderberry stands (Service 1984). Habitat fragmentation exacerbates problems related to exotic species invasion and cattle overgrazing by increasing the edge to interior ratio of habitat patches, facilitating the penetration of these influences.

Environmental Baseline

SR 99 is a principal arterial roadway that provides a major corridor for goods movement through Tulare and Fresno counties. Freight trucks comprise 35 percent of the average daily traffic on this segment of SR 99. The San Joaquin kit fox and valley elderberry longhorn beetle are affected by the existing SR 99, which has diminished habitat quality and has created a potential movement barrier.

San Joaquin kit fox

There has never been a comprehensive survey of San Joaquin kit foxes or their habitat except for one core population in western Kern County. What is known comes from incidental sightings, local surveys, research projects, and aerial photos. There are more than several hundred recorded sightings of San Joaquin kit foxes in the San Joaquin Valley (CNDDDB 2004). Given the biology and ecology of the animal (San Joaquin kit foxes have been documented to move 9 miles or more in a single night), the kit fox is highly likely to inhabit the action area. Ruderal lands, row

cropland, fallow fields, and orchards provide denning and foraging habitat, although farming activities have likely reduced denning opportunities and prey base. Kit foxes are able to travel through fallow and active agricultural fields, seasonal wetland areas, and old orchards for both local movement and long distance dispersal. Seasonal wetlands may also provide amphibian prey for kit foxes.

The California Natural Diversity Database (CNDDDB 2004) reports sightings of San Joaquin kit fox in quadrangles within and surrounding the action area. A large, unplowed tract of open grassland exists adjacent to the action area along Cross Creek. This habitat block provides suitable denning and foraging habitat for kit foxes, and is one of the last remaining contiguous blocks of natural land in the SR 99 route corridor in Tulare County. The Service has identified similar areas as potential migration corridors for kit foxes, and highlighted the recovery value of migration corridors in the Recovery Plan.

The existing SR 99 has diminished habitat quality for the San Joaquin kit fox, by creating a dispersal barrier that results in habitat fragmentation. Crossing the road is dangerous for kit foxes, and likely creates a barrier to movement. Spotlighting surveys were conducted in September 2003, and scent and camera stations were monitored under SR 99 at the bridge and culvert undercrossings in the Cross Creek vicinity. No kit foxes were observed. The existing right-of-way is highly disturbed, and does not provide suitable kit fox foraging or denning habitat. The new right-of-way that will be acquired includes an existing commercial RV campground, an orchard, and two pastures. The pastures are large horse and cattle pens isolated between SR 99, rural residences, and the commercial RV campground. The pastures are heavily grazed, resulting in very short vegetation. These pastures are highly disturbed, and it is unlikely that kit foxes use these pastures. Given the CNDDDB records, the biology and ecology of this species, and the presence of suitable habitat adjacent to the action area, the Service believes the San Joaquin kit fox is reasonably certain to occur within the action area, and may use the action area as a movement corridor.

Valley elderberry longhorn beetle

There is one CNDDDB record (CNDDDB 2004) for valley elderberry longhorn beetle exit holes in elderberry shrubs along the Kings River. There are also records from several rivers and their tributaries in Tulare County, including the Kaweah River, Tule River, and Deer Creek. Ten elderberry shrubs occur within or adjacent to the action area, with a total of 63 stems greater than one inch at ground level. Beetle exit holes were not observed in any of the shrubs. Two of the shrubs are located within riparian habitat. Given the CNDDDB records, the biology and ecology of this species, and the presence of suitable habitat on-site, the Service believes the beetle is reasonably certain to occur within the action area. Designated critical habitat does not occur within the action area.

Effects of the Proposed Action

San Joaquin Kit Fox

The land that will be added to the existing right-of-way (3.66 acres) is likely not suitable kit fox habitat, and therefore does not represent a loss of habitat for this species. The remaining project is within the existing right-of-way, and will not result in a loss of kit fox habitat. The proposed project may affect a potential kit fox migration corridor, particularly in the Cross Creek area. In the event that a kit fox may attempt to cross SR 99, it is reasonable to infer that it would find it more difficult to avoid a vehicle strike while crossing over new freeway. Currently, kit fox are exposed to the traffic along the existing SR 99; however, crossing the additional two lanes may result in increased mortality. To minimize this mortality, existing bridges and box culverts would remain in place to facilitate safe kit fox crossings. A new median barrier and right-of-way fences will be designed to minimize take of kit foxes.

San Joaquin kit fox mortality and injury occurs when the animals attempt to cross roads and are hit by cars, trucks, or motorcycles. The majority of strikes likely occur at night when the animals are most active. Driver visibility also is lower at night increasing the potential for strikes. Such strikes are usually fatal for an animal the size of a kit fox. Thus, vehicle strikes are a direct source of mortality for the San Joaquin kit fox. If vehicle strikes are sufficiently frequent in a given locality, they could result in reduced kit fox abundance. The death of kit foxes during the November-January breeding season could result in reduced reproductive success. Death of females during gestation or prior to pup weaning could result in the loss of an entire litter of young, and therefore, reduced recruitment of new individuals into the population.

Occurrences of vehicle strikes involving San Joaquin kit foxes have been well documented, and such strikes occur throughout the range of the species. Sources of kit fox mortality were examined during 1980-1995 at the Naval Petroleum Reserves in California in western Kern County (Cypher *et al.* 2000). During this period, 341 adult San Joaquin kit foxes were monitored using radio telemetry, and 225 of these animals were recovered dead. Of these, 20 were struck by vehicles; 9% of adult kit mortalities were attributed to vehicles, and 6% of all monitored adults were killed by vehicles. During this same period, 184 juvenile (<1 year old) kit foxes were monitored. Of these, 142 were recovered dead and 11 were killed by vehicles; 8% of juvenile kit fox mortalities were attributed to vehicles and 6% of all monitored juveniles were killed by vehicles. For both adults and juveniles, vehicle strikes accounted for less than 10% of all San Joaquin kit fox deaths in most years. However, in some years, vehicles accounted for about 20% of deaths.

In areas of western Kern County, 49 kit foxes were radio-collared in the highly developed Midway-Sunset oil field, and 54 kit foxes were radio-collared in the Lokern Natural Area, a nearby undeveloped area, during 1989-1993 (Spiegel and Disney 1996). Of these animals, 60 were recovered dead; 1 (2%) was killed by a vehicle, and it was found in an undeveloped area along the access road adjacent to the California aqueduct. However, six non-collared kit foxes

were killed by vehicles on the access road. Forty-one San Joaquin kit foxes were radio-collared and monitored during 1989-1991 on the Carrizo Plain Natural Area in eastern San Luis Obispo County (Ralls and White 1995). Twenty-two were found dead; 1 (5%) was attributed to a vehicle strike. At Camp Roberts in Monterey and San Luis Obispo counties, 94 San Joaquin kit foxes were radio-collared during 1988-1992 (Standley *et al.* 1992). Forty-nine were found dead and 2 were attributed to vehicle strikes; 4% of the deaths were caused by vehicles and 2% of all monitored kit foxes were killed by vehicles.

In the City of Bakersfield, 113 San Joaquin kit foxes were radio-collared and monitored during 1997-2000 (Cypher 2000). Thirty-five were recovered dead (23 adults and 12 pups); 9 adults (39%) and 6 pups (50%) were attributed to vehicle strikes. At this urban site, coyotes and bobcats are rare, and vehicles are the primary source of kit fox mortality. However, survival rates are higher than rates among kit foxes in non-urban areas, and vehicles do not appear to be limiting the population size.

The local and range-wide effects of vehicle strikes on San Joaquin kit foxes have not been adequately assessed. Vehicle strikes appear to occur most frequently where roads transverse areas where kit foxes are abundant. However, the linear quantity of roads in a given area may not be directly related to the number of vehicle strikes in a given area, as exemplified by the situation at the Naval Petroleum Reserve. The type of road (e.g., number of lanes), traffic volume, and average speed of vehicles likely all influence the number of San Joaquin kit fox/vehicle strikes. The number of strikes likely increases with road size, traffic volume, and average speed (Clevenger and Waltho 1999). Another factor influencing the number of vehicles striking San Joaquin kit foxes, but for which little data are available, is the frequency with which the animals cross roads and are therefore at risk. The proportion of successful road crossings by these animals likely declines with increasing road size, traffic volume and density, and vehicle speeds. The proportion of San Joaquin kit foxes successfully crossing roads may increase in areas where they obtain more experience crossing roads, such as in and near urban areas.

The potential for increased mortality on the expanded State Route 99 creates a barrier to kit fox dispersal, further fragmenting remaining habitat. Knapp (1978) monitored movements of radio-collared San Joaquin kit foxes in the vicinity of Interstate 5 in Kern County. Many of the foxes used areas within 2 miles of the highway, and most exhibited movement and home range patterns that parallel the highway, but did not cross it. Only on two occasions were animals located on the opposite side of the highway from their primary area of use. Interstate 5 appears to fragment the habitat by restricting the movement of the San Joaquin kit fox.

In addition to limiting access to habitat patches, roads also may reduce the suitability of habitat for San Joaquin kit foxes by fragmentation into patches too small for their effective use by the animals. As a habitat patch decreases in size, the number of San Joaquin kit foxes the patch can support also decreases. This increases the probability that the animals will be extirpated from each patch. The possibility for recolonization will depend upon the nature of the factors, e.g., roads, canals, development, etc., that are causing the fragmentation. Estimates of home range

size for the San Joaquin kit fox vary from 1.7 square miles to 4.5 square miles (White and Ralls 1993). Typically, a mated pair will share a home range. If a habitat fragment is too small to support a home range, it may be abandoned by the animals.

Fragmentation factors that effectively isolate patches and limit access also constitute barriers to San Joaquin kit fox movements, dispersal, and gene flow. Movements and dispersal corridors are critical to kit fox population dynamics, particularly because the animals currently persist as metapopulations with multiple disjunct population centers. Movement and dispersal corridors are important for alleviating over-crowding and intraspecific competition during years when San Joaquin kit fox abundance is high, and are also important for facilitating the recolonization of areas where the animal has been extirpated. Movement between population centers maintains gene flow and reduces genetic isolation. Genetically isolated populations are at greater risk of deleterious genetic effects such as inbreeding and genetic drift.

Construction, maintenance, and operational activities associated with roads may result in a disturbance effect on nearby San Joaquin kit foxes. During construction, kit foxes may become inadvertently trapped in steep-walled holes or trenches, and subsequently injured or killed if not discovered by workers, or harassed when workers try to coax the fox into vacating. San Joaquin kit foxes will often use culverts, pipes, or similar structures for dens; injury, death, or harassment could result if a fox begins to inhabit one of these structures. Kit fox habitat could be disturbed by construction worker encroachment or damage from project-related vehicles. The kit fox and its associated predators may be attracted to the project area by discarded food items, increasing the likelihood of death, injury, or harassment. Light from the project area may make the kit fox more visible to predators, and may interfere with the kit fox's foraging ability.

Disturbance can result from noise, vibration, odors, or human activity, particularly during the night when kit foxes are maximally active. Disturbance may affect the kit foxes by interfering with sensory perception, which could interfere with their ability to locate prey, pups, or mates, or detect approaching predators. Disturbance could induce stress which may affect physiological parameters or behavior. The resulting effects could include increased energetic requirements, decreased reproductive output, decreased immunological functions, altered space use patterns, displacement, or possibly death. Observations from a variety of sources and situations suggest that San Joaquin kit foxes may not be significantly affected by disturbance, even when the source is prolonged or continuous (Cypher 2000). However, individual animals may be more affected than others, and it is unknown whether disturbance may result in reduced local abundance.

An increase in the ambient noise level is not, in itself, likely to cause direct harm to kit foxes. No specific research has been performed on this species but a "safe, short-term level" for humans has been determined to be 75 decibels (dBA) (NIH 1990; Burglund and Lindvall 1995). The mechanisms leading to permanent hearing damage are the same for all mammals (NIH 1990). However, the enlarged pinna and reduced tragi of kit foxes indicate that hearing is more acute than in humans (Jameson and Peeters 1988). Hearing loss in humans has been correlated with cognitive dysfunction (NIH 1990). However, variation in response to intense noise has been

found to vary, in humans, by as much as 30 to 50 dBA between individuals (NIH 1990). Similar variation has been found in animal studies as well (NIH 1990). Younger animals have been shown to be more susceptible to noise-induced hearing loss (NIH 1990). The ability to habituate to noise appears to vary widely between species (NPS 1990). Typical construction machinery produces noise in the range of 75 dBA (arc-welder) to 85 dBA (bulldozer) (Burglund and Lindvall 1995). Long-term noise levels of 85 dBA are recognized to cause permanent hearing damage in humans (NIH 1990). Noise at the 85 dBA level has been correlated with hypertension in Rhesus monkeys (*Macaca fascicularis*) (Cornman 2001). Increased reproductive failure in laboratory mice (*Mus musculus*) was found to occur after a level of 82-85 dBA for one week (Cornman 2001). Hearing loss from motorcycle traffic has been documented for the kangaroo rat (*Dipodomys* species) (Bondello and Brattstrom 1979) and desert kangaroo rats (*Dipodomys deserti*) showed a significant reduction in reaction distance to the sidewinder (*Crotalus cerastes*) after exposure to 95 dBA (Cornman 2001). Other desert mammals appear to sustain the same impacts from noise (Bondello and Brattstrom 1979). Aircraft noise has produced accelerated heart-rates in pronghorn (*Antilocapra americana*), bighorn sheep (*Ovis canadensis*), and elk (*Cervus elaphus*) (U.S. National Park Service (NPS) 1994).

Harassment from long-term noise may cause kit foxes to eventually vacate the project-site and adjacent areas. Grizzly bears (*Ursus arctos*), mountain goats (*Oreamnos canadensis*), caribou (*Rangifer* species), and bighorn sheep (*Ovis spp*) have all been found to abandon foraging or calving areas in response to aircraft noise (NPS 1994).

The presence of roads in an area could result in the introduction of chemical contaminants to the site. Contaminants could be introduced in several ways. Substances used in road building materials or to recondition roads can leach out or wash off roads adjacent habitat. Vehicle exhaust emissions can include hazardous substances which may concentrate in soils along roads. Heavy metals such as lead, aluminum, iron, cadmium, copper, manganese, titanium, nickel, zinc, and boron are all emitted in vehicle exhaust (Trombulak and Frissell 2000). Concentrations of organic pollutants (eg, dioxins, polychlorinated biphenyls) are higher in soils along roads (Benfenati *et al* 1992). Ozone levels are higher in the air near roads (Trombulak and Frissell 2000). Vehicles may leak hazardous substances such as motor oil and antifreeze. Although the quantity leaked by a given vehicle may be minute, these substances can accumulate on roads and then get washed into the adjacent environment by runoff during rain storms. An immense variety of substances could be introduced during accidental spills of materials. Such spills can result from small containers falling off passing vehicles, or from accidents resulting in whole loads being spilled. Large spills may be partially or completely mitigated by clean-up efforts, depending on the substance.

San Joaquin kit foxes using areas adjacent to roads could be exposed to any contaminants that are present at the site. Exposure pathways could include inhalation, dermal contact, direct ingestion, ingestion of contaminated soil or plants, or consumption of contaminated prey. Exposure to contaminants could cause short- or long-term morbidity, possibly resulting in reduced productivity or mortality. Carcinogenic substances could cause genetic damage resulting in

sterility, reduced productivity, or reduced fitness among progeny. Contaminants also may have the same effect on kit fox prey species. This could result in reduced prey abundance and diminished local carrying capacity for the kit fox.

Little information is available on the effects of contaminants on the San Joaquin kit fox. The effects may be difficult to detect. Morbidity or mortality likely would occur after the animals had left the contaminated site, and more subtle effects such as genetic damage could only be detected through intensive study and monitoring. However, effects have been detected on some occasions. At the Naval Petroleum Reserve, 3 kit foxes are known to have been killed by drowning in spills of crude oil (Cypher *et al* 2000). Spiegel and Disney (1996) reported that a kit fox was found covered with crude oil at the Midway-Sunset oil field, and this individual died despite treatment. Such spills potentially can cause local reductions in the abundance of kit foxes and their prey.

Roads can facilitate the invasion and establishment by species not native to the area. Disturbance and alteration of habitat adjacent to roads may create favorable conditions for non-native plants and animals, which can then spread along roadsides and into adjacent habitat. Non-native animals may use modified habitats adjacent to the road to disperse into kit fox habitat. These exotic animals could compete with kit foxes for resources such as food or dens, or directly injure or kill kit foxes. Non-native plants and animals may reduce habitat quality for kit foxes or their prey, and reduce the productivity or the local carrying capacity for the kit fox. Introductions of non-native species could cause kit foxes to alter behavioral patterns by avoiding or abandoning areas near road (Cypher 2000).

Disturbed areas adjacent to roads provide favorable habitat conditions for a number of non-native plant species. Some of these taxa are aggressively invasive and they can alter natural communities and potentially affect habitat quality. A problematic species within the range of the San Joaquin kit fox is yellow star thistle (*Centaurea melitensis*). Dense stands of this plant can form along roadsides and then spread into adjacent habitat. This plant displaces native vegetation, competes with native plants for resources, does not appear to be used by kit fox prey, and may be difficult for kit foxes to move through due its large size (up to 1 meter or 3.3 feet tall) and numerous sharp spines (Cypher 2000). Other species that may disperse along roads and invade adjacent habitat include mustards (*Brassica* species) and Russian thistle (*Salsola tragus*) (Tellman 1997). Disturbed soils and reduced competition from native plants are some of the conditions that facilitate invasion along roads by non-native plant species. Nitrogen from vehicle exhaust is deposited in habitats adjacent to roads, and the resulting enhanced nitrogen levels appear to promote growth of non-native species, particularly exotic grasses (Weiss 1999). These grasses, such as red brome (*Bromus madritensis rubens*), create dense ground cover in the San Joaquin Valley, and this dense cover appears to reduce habitat quality for various small mammal species, such as kangaroo rats, which are an important prey for kit foxes (Goldingay *et al.* 1997; Cypher 2000).

Roads may serve as travel corridors for non-native red foxes. Red foxes can kill San Joaquin kit foxes (Ralls and White 1995), and likely compete with kit foxes for food and dens. Red foxes are infrequently observed in large blocks of undisturbed habitat within the range of the San Joaquin kit fox, possibly due to the absence of permanent water or the presence of coyotes which prey upon red foxes. Along roads, water availability may be higher due to pooling of precipitation runoff or anthropogenic development, and coyotes may be less abundant due to the presence of humans. Roads may facilitate movements of red foxes and increase access to kit fox habitat.

Adverse effects to wildlife populations from roads may extend some distance from the actual road. The phenomenon can result from any of the effects already described in this biological opinion (e.g. vehicle-related mortality, habitat degradation, invasive exotic species, etc.). Forman and Deblinger (2000) described the effect as the "road effect" zone. Along a 4-lane road in Massachusetts, they determined that this zone extend for an average of approximately 980 ft to either side of the road for an average total zone width of approximately 1970 feet. However, in places they detected an effect > 0.6 miles from the road. Rudolph *et al.* (1999) detected reduced snake abundance up to 2,790 feet from roads in Texas. They estimated snake abundance out to 2,790 feet, so the effect may have been greater. Extrapolating to a landscape scale, they concluded the effect of roads on snake populations in Texas likely was significant, given that approximately 79% of the land area of Texas is within 1,640 feet of a road.

Effects within the road zone can be subtle. Van der Zande *et al.* (1980) reported that lapwings (*Vanellus vanellus*) and black-tailed godwits (*Limosa limosa*) feeding at 1,575-6,560 feet from roads were disturbed by passing vehicles. The heart rate, metabolic rate and energy expenditure of female bighorn sheep (*Ovis canadensis*) increases near roads (MacArthur *et al.* 1979). Trombulak and Frissell (2000) described another type of road zone effect. Heavy metal concentrations from vehicle exhaust were greatest within 66 feet of roads, but elevated levels of metals in both soil and plants were detected at ≥ 660 feet of roads. The road effect zone apparently varies with habitat type and traffic volume. Based on responses by birds, Forman (2000) estimated the effect zone along primary roads at 1,000 feet in woodlands, 1,197 feet in grasslands, and 2,657 feet in natural lands near urban areas. Along secondary roads with lower traffic volumes, the effect zone was 656 feet. The road effect zone and the San Joaquin kit fox have not been adequately investigated; however, it is possible it exists given the effects of roads on the animal.

Valley Elderberry Longhorn Beetle

The proposed action will adversely affect the beetle by the stress, damage, and mortality that could be caused from the transplanting of seven shrubs, with 44 stems measuring 1.0 inch or greater in diameter at ground level. The two elderberry plants that will remain within the action area may be affected by dust from construction activities. Encroachment within 100 feet of the driplines of these two elderberry shrubs could result in root damage to the plants. However, their location on a railroad berm is likely to shelter them from damage by construction activities. Elderberry plants which are too small to be likely supportive of larval beetles may be destroyed

without transplantation or compensation. However, were they not destroyed, such small plants could potentially grow larger and produce stems capable of serving as habitat for the beetle. Benefits to the beetle include the creation of additional habitat through the compensation measures proposed in the project. The habitat available at the compensation site will be more conducive to beetle recovery because of the habitat quality, and the reduced risk from vehicle-related catastrophes.

Cumulative Effects

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

In general, many agricultural activities occur without Federal consultation and these activities are expected to continue on the agricultural lands adjacent to SR 99. Certain agricultural practices, such as disking, can destroy kit fox dens and reduce their prey base. Destruction of adjacent riparian habitat can eliminate habitat essential for the survival and recovery of the valley elderberry longhorn beetle. There are no additional projects scheduled to occur within the action area.

Conclusion

After reviewing the current status of the San Joaquin kit fox and the valley elderberry longhorn beetle, the environmental baseline for the action area, the effects of the proposed widening of SR 99 in Tulare and Fresno Counties, California, and cumulative effects, it is the Service's biological opinion that the proposed project is not likely to jeopardize the continued existence of any of the above listed species, or adversely modify proposed or designated critical habitat. The proposed project involves the expansion of an existing high-volume road, which has degraded the environmental baseline in the action area, and the negative effects of the proposed project are sufficiently offset by conservation measures to avoid jeopardy to the San Joaquin kit fox and the valley elderberry longhorn beetle. The newly-acquired right-of-way does not provide suitable habitat for the kit fox, and is not likely to adversely affect the San Joaquin kit fox. The proposed project is not likely to affect critical habitat for the kit fox, as none has been proposed or designated. The designated critical habitat for the valley elderberry longhorn beetle is not located within the action area, and will not be affected by the proposed project.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is

defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement. The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

San Joaquin Kit Fox

The Service expects that incidental take of San Joaquin kit foxes will be difficult to detect or quantify for the following reasons: (1) their relatively small body size makes the finding of a dead specimen unlikely, (2) losses may be masked by seasonal fluctuations in numbers or other causes, and (3) the species often occurs in dens and burrows. Due to the difficulty in quantifying the number of San Joaquin kit foxes that will be taken as a result of the proposed action, the Service is quantifying take incidental to the project as all San Joaquin kit foxes that inhabit areas immediately adjacent to the 13.6-mile length of road. The incidental take will be in the form of harm and harassment.

Valley Elderberry Longhorn Beetle

The Service has determined that implementation of the proposed project will result in the incidental take of all beetles inhabiting 7 elderberry shrubs containing 84 stems measuring 1.0 inch or greater in diameter at ground level. This incidental take allowance takes into consideration the project schedule (construction will not begin for six years) and additional stem growth that may occur prior to construction. The incidental take will be in the form of death, injury, harassment, or harm.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the San Joaquin kit fox or the valley elderberry longhorn beetle. The conservation measures of the proposed project will reduce the likelihood of kit fox mortality resulting from an expanded highway, and the compensation incorporated within the conservation measures will enhance the survival and recovery of the valley elderberry longhorn beetle.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the effect of the proposed project on the San Joaquin kit fox and the valley elderberry longhorn beetle.

1. Caltrans shall implement the conservation measures as described in the biological assessment and this biological opinion.
2. Caltrans shall minimize adverse effects to the San Joaquin kit fox.
3. Caltrans shall minimize adverse effects to the valley elderberry longhorn beetle.
4. Caltrans shall ensure compliance with this biological opinion.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, FHWA shall ensure Caltrans complies with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

1. The following Terms and Conditions implement Reasonable and Prudent Measure One (1):
 - a. Caltrans shall minimize the potential for harm or harassment of listed species resulting from project-related activities by implementation of the conservation measures as described in the biological assessment, and the *Description of the Proposed Action* section of this biological opinion.
 - b. Caltrans shall include Special Provisions that include the avoidance and minimization measures of this biological opinion in the solicitation for bid information. Caltrans will educate and inform contractors involved in the project as to the requirements of the biological opinion.

- c. Prior to initiation of any site preparation/construction activities, the Caltrans biologist or Service-approved biologist will conduct an education and training session for all construction personnel. All available individuals who will be involved in the site preparation or construction will be present, including the project representative(s) responsible for reporting take to the Service and the California Department of Fish and Game. Training sessions will be repeated for all new employees before they are allowed to access the project site. Sign-up sheets identifying attendees and the contractor/company they represent will be provided to the Service with the post-construction compliance report. At a minimum, the training will include a description of the natural history of the San Joaquin kit fox and the valley elderberry longhorn beetle, and their respective habitats. Training will include the general measures that are being implemented to conserve these species as they relate to the project, the penalties for non-compliance, and the boundaries (work area) within which the project must be accomplished. To ensure that employees and contractors understand their roles and responsibilities, training may have to be conducted in languages other than English.
- d. The resident engineer (RE) or their designee shall be responsible for implementing these conservation measures and shall be the point of contact for each project.
- e. If borrow material is going to be used for the proposed project, Caltrans shall follow the procedures outlined below:
 1. Caltrans shall require as part of the construction contract that all contractors comply with the Act in the performance of the work necessary for project completion performed inside and outside the project right-of-way.
 2. Caltrans shall require documentation from the contractor that aggregate, fill, or borrow material provided for each project was obtained in compliance with the Act. Evidence of compliance with the Act shall be demonstrated by providing the RE any one of the following:
 - a. a letter from the Service stating use of the borrow pit area will not result in the incidental take of listed species;
 - b. an incidental take permit for contractor-related activities issued by the Service pursuant to section 10(a)(1)(B) of the Act;
 - c. a biological opinion or a letter concurring with a "not likely to adversely affect" determination issued by the Service to the Federal agency having jurisdiction over contractor-related activities;

- d. a letter from the Service concurring with the "no effect" determination for contractor-related activities; or
 - e. Contractor submittal of information to the Caltrans RE indicating compliance with the State Mining and Reclamation Act (SMARA) and providing the County land use permits and CEQA clearance.
3. If a borrow site that is in compliance with the Act is not available, Caltrans will either:
- a. identify/select a site that the Service has concurred with the "no effect" determination, or;
 - b. request reinitiation of formal consultation on the action considered herein based on new information.
- f. The Caltrans biologist shall have oversight over implementation of all the measures described in the *Terms and Conditions* of this biological opinion, and he/she shall have the authority to stop project activities, through communication with the Caltrans RE, if any of the requirements associated with these measures are not being fulfilled. If the biologist/construction liaison has requested a stop work due to take of any listed species, the Service and Fish and Game will be notified within one (1) day via email or telephone.
2. The following Terms and Conditions implement Reasonable and Prudent Measure Two (2):
- a. Pre-construction surveys for kit fox dens within the project area shall be conducted no more than 30 calendar days prior to the start of construction in accordance with the most current protocols approved by the Service and the California Department of Fish and Game. Surveys for dens shall be conducted by qualified biologists with demonstrated experience in identifying San Joaquin kit fox dens. If potential kit fox dens are observed, the Service will be notified within one (1) day via email or telephone, and construction cannot begin without approval from the Service.
 - b. Project employees shall be directed to exercise caution when commuting within the habitat of the San Joaquin kit fox. A 20-mile per hour speed limit will be strongly encouraged on unpaved roads within the habitat of this species. Cross-country travel by vehicles will be prohibited, unless authorized by the Service. Project employees shall be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.
 - c. A litter control program shall be instituted at each project site. All workers will ensure their food scraps, paper wrappers, food containers, cans, bottles, and other

trash from the project area are deposited in covered or closed trash containers. The trash containers shall be removed from the project area at the end of each working day.

- d. No canine or feline pets or firearms (except for Federal, State, or local law enforcement officers and security personnel) shall be permitted on construction sites to avoid harassment or killing or injuring of listed species.
- e. Maintenance and construction excavations greater than 2 feet deep either shall be covered, filled in at the end of each working day, or have earthen escape ramps no greater than 200 feet apart provided to prevent entrapment of the San Joaquin kit fox.
- f. All construction activity shall be confined within the project site, which may include temporary access roads, haul roads, and staging areas specifically designated and marked for these purposes. At no time shall equipment or personnel be allowed to adversely affect habitat areas outside the project site without authorization from the Service.
- g. The portion of the project area within which construction is occurring shall be delineated with high visibility temporary fencing at least five (5) feet in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment onto any sensitive areas during project work activities. Such fencing shall be inspected and maintained daily until completion of the project. The fencing will be removed only when all construction equipment is removed from that portion of the project area.
- h. Only Service-approved workers holding valid permits issued pursuant to section 10(a)(1)(A) of the Act are allowed to trap or capture the San Joaquin kit fox. Any relocation plan will be approved by the Service prior to release of any kit foxes.
- i. All grindings and asphaltic-concrete waste shall be stored within previously disturbed areas absent of habitat and at a minimum of 150 feet from any culvert, wash, pond, vernal pool, or stream crossing.
- j. Because dusk and dawn are often the times when the San Joaquin kit fox is most actively foraging, all construction activities will cease one half hour before sunset and will not begin prior to one half hour before sunrise. Except when necessary for driver or pedestrian safety, lighting of a project site by artificial lighting during night time hours is prohibited.
- k. Use of rodenticides and herbicides at the project site shall be utilized in such a manner to prevent primary or secondary poisoning of the San Joaquin kit fox, and

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the depletion of prey populations on which it depends. All uses of such compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Pesticide Regulation, and other appropriate State and Federal regulations, as well as additional project-related restrictions deemed necessary by the Service or the California Department of Fish and Game.

- l. Pipes or culverts with a diameter greater than 4 inches shall be capped or taped closed when it is ascertained that no San Joaquin kit fox is present. Any kit fox found in a pipe or culvert shall be allowed to escape unimpeded.
 - m. Restoration and revegetation work associated with temporary effects shall be done using California endemic plant material from on-site or local sources (i.e., local ecotype). Plant materials from non-local sources shall be allowed only with written authorization from the Service. To the maximum extent practical (i.e., presence of natural lands), topsoil shall be removed, cached, and returned to the site according to successful restoration protocols. Loss of soil from run-off or erosion shall be prevented with straw bales, straw wattles, or similar means provided they do not entangle, block escape or dispersal routes of the San Joaquin kit fox.
3. The following Term and Condition implements Reasonable and Prudent Measure Three (3):
 - a. Within one year prior to construction, Caltrans shall perform an elderberry shrub survey to determine the number of elderberry stems greater than one inch in diameter at ground level. A report will be provided to the Service within one (1) month of the surveys, containing survey data and the number of elderberry seedlings and associated native species that will be planted for compensation.
 4. The following Terms and Conditions implement Reasonable and Prudent Measure Four (4):
 - a. If requested, before, during, or upon completion of ground breaking and construction activities, Caltrans shall allow access by Service and/or California Department of Fish and Game personnel to the project site to inspect project effects to the San Joaquin kit fox, the valley elderberry longhorn beetle, and their respective habitats.
 - b. Caltrans shall comply with the *Reporting Requirements* of this biological opinion.

Reporting Requirements

1. A post-construction report detailing compliance with the project design criteria described under the *Description of the Proposed Action* section of this biological opinion shall be provided to the Service within 30 calendar days of completion of the project.
2. Caltrans shall notify the Service via electronic mail and telephone within one (1) working day of the death or injury to a listed species that occurs due to project-related activities, or is observed at the project site. Notification must include the date, time, location of the incident or of the finding of a dead or injured animal, and photographs of the specific animal. In the case of an injured animal, the animal shall be cared for by a licensed veterinarian or other qualified person. In the case of a dead animal, the individual animal should be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or the Service takes custody of the specimen. The Service contacts are Peter Cross, Chief of the Endangered Species Division (Central Valley) at 916/414-6600, and Scott Heard, Resident Agent-in-Charge of the Service's Law Enforcement Division at 916/414-6660. The California Department of Fish and Game contact is Ron Schlorff at 916/654-4262.
3. Any contractor or employee who, during routine operations and maintenance activities inadvertently kills or injures a State-listed wildlife species shall immediately report the incident to her or his supervisor or representative. The supervisor or representative must contact the California Department of Fish and Game immediately in the case of a dead or injured State-listed wildlife species. The California Department of Fish and Game contact for immediate assistance is State Dispatch at 916/445-0045.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and databases. Our conservation recommendations are as follows:

1. The FHWA should assist the Service, through personnel and funding, in gathering additional data on the reproduction, demography, and dispersal of the San Joaquin kit fox, and implementing recovery strategies.
2. The FHWA should actively protect and create additional habitat for the San Joaquin kit fox throughout Tulare and Fresno Counties, and help maintain movement corridors.

3. The FHWA should participate in planning for regional habitat conservation plans for the San Joaquin kit fox.
4. The FHWA and Caltrans should research and implement roadway designs and structures that are more conducive to safe wildlife dispersal, such as wildlife overpasses, underpasses, fencing, and medians.
5. As the recovery plan for federally-listed vernal pool flora and fauna is developed, the FWHA should assist the Service in its implementation.
6. When designing projects, FHWA and Caltrans should assign highest priority to alternatives that completely avoid adverse effects to listed species.
7. FHWA and Caltrans should actively promote alternative forms of transportation to alleviate the increased need for road expansions (and consequent increased loss of habitat) required by higher traffic volumes.
8. FHWA and Caltrans should provide habitat for bats, including surfaces for bat roosts, on the underside of bridges and other structures, whenever possible.

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

REINITIATION – CLOSING STATEMENT

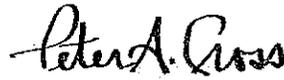
This concludes formal consultation on the SR 99 project in Tulare and Fresno Counties, California, as outlined in the request and associated documents. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Mr. Gene Fong

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If you have any questions regarding this biological opinion on the proposed improvement of SR 99 in Tulare and Fresno Counties, California, please contact Amy Welsh or Susan Jones, Chief of our San Joaquin Valley Branch, at (916) 414-6630.

Sincerely,



for Kenneth Sanchez
Acting Field Supervisor

cc:

Brett Dickerson, U.S. Fish and Wildlife Service, Clovis, California
Claire Bromund, Jones and Stokes, Sacramento, California
Marcia Viera, Tulare County Resource Management Agency, Visalia, California
Carrie Bowen, Jennifer Taylor, California Department of Transportation, Fresno, California
Dee Warenycia, California Department of Fish and Game, Sacramento, California
Annette Tenneboe, Bill Loudermilk, Jeff Single, Clarence Mayott, Dan Applebee, California
Department of Fish and Game, Fresno, California

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Mr. Gene Fong

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Schwartz, M. March 23, 2000. University of Montana, Missoula, pers. comm. to P.J. White,
U.S. Fish and Wildlife Service, Sacramento, California



United States Department of the Interior



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In reply refer to:
81420-2009-F-0752

SEP 24 2009

Walter C. Waidelich, Jr.
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Subject: Amended Biological Opinion for the State Route 99 Goshen to Kingsburg
6-Lane Project, Tulare and Fresno Counties (FRE/TUL-99-PM FRE R0.0/R1.0;
TUL 41.3/R53.9)

Dear Mr. Waidelich:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) May 6, 2009 receipt of the California Department of Transportation's (Caltrans) April 30, 2009, letter requesting reinitiation of formal consultation for the proposed State Route (SR) 99 Goshen to Kingsburg 6-Lane Project in Tulare and Fresno Counties, California (proposed project). This response is in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act). The proposed project is in the design, right-of-way acquisition, and permitting phase. Construction is scheduled to begin in the summer 2010. The Service issued a biological opinion for the proposed project on June 23, 2005 (Service file number 1-1-05-F-0040; Service 2005) for the impacts on the federally-listed as threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (beetle) and the federally-listed as endangered San Joaquin kit fox (*Vulpes macrotis mutica*) (kit fox). Caltrans is proposing changes to the project description that may result in impacts to the kit fox and the beetle beyond what was described in the June 2005 biological opinion (Service 2005).

The proposed project, as described in the November 2004 Biological Assessment (Caltrans 2004) and the June 2005 biological opinion (Service 2005), included the expansion of 13.6 miles of SR 99 between Goshen, Tulare County, and Kingsburg, Fresno County, from a four-lane to a six-lane highway. The proposed project also included changing the existing metal thrie-beam guardrail along the 13.6 miles of SR 99 to an alternating double concrete median barrier and metal thrie-beam (except a 0.7-mile section along a potential kit fox migration corridor near Cross Creek would retain its metal thrie-beam guardrail). Night-time work was prohibited in the

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June 2005 biological opinion (Service 2005) for the protection of the kit fox. The Service authorized the incidental take of all kit foxes near the 13.6-mile project construction area in the form of "harm and harassment" (Service 2005, p. 28). The Service also authorized the incidental take of all beetles inhabiting the seven elderberry shrubs (*Sambucus* sp.) containing 84 stems measuring 1.0 inch or greater in diameter at ground level that would have to be transplanted. The number of elderberry stems (84) was estimated based on the anticipated growth that would occur between when the elderberry shrubs were surveyed in 2004 and when project construction was scheduled to begin in 2010. The take of the beetles would be in the form of "death, injury, harassment, or harm" (Service 2005, p. 28).

Caltrans is reinitiating formal consultation due to changes in the proposed project that may result in additional impacts to the kit fox and the beetle. An additional three elderberry shrubs are within 20 feet of ground-disturbing activities and will require transplantation and compensation. Caltrans, because of changes to the median barrier design, is also requesting amendments to the Terms and Conditions in the June 2005 biological opinion (Service 2005) as they pertain to kit fox as follows:

- In order to maximize safety as well as deliver the project within cost and schedule, Caltrans is requesting that 100 days of night-time work be allowed.
- Instead of alternating thrie-beam and concrete median barrier throughout the project, Caltrans is requesting use of thrie-beam only at Cross Creek (0.7 mile long).
- Throughout the project, a double concrete barrier wildlife passageway fence is proposed (a modified Type 60/S). This fence type consists of a concrete barrier with 9-inch radius openings (9 inches high x 18 inches wide half circle openings) spaced every 150 feet to allow wildlife passage. Within the median, the distance between the concrete barriers will range from 19 feet to 23 feet.
- 25 concrete barrier wildlife passageway fences (Type M) are proposed at transition areas between the Type 60 barriers. The Type M fence consists of a concrete median barrier with 24 inches-long thrie-beam (8 inches high x 24 inches wide rectangular openings) to allow for wildlife passage. The Type M fences would be spaced on average every 0.5 mile.
- One concrete barrier wildlife passageway fence (Type L) is proposed approximately 2,000 feet south of the thrie-beam fence next to Cross Creek. The fence opening of 18.5 feet will be used primarily for emergency vehicle access but will also serve as an opening for wildlife.

The findings and recommendations in this reinitiation of formal consultation are based on: (1) the original November 2004 *Goshen to Kingsburg Six-Lane Project Biological Assessment* (Caltrans 2004); (2) the Service's initial June 2005 biological opinion for the proposed project (Service 2005); (3) the April 30, 2009 letter from Caltrans reinitiating formal consultation for the proposed project (Z. Parker, Caltrans, *in litt.* 2009); (4) conversations with Zachary Parker and other Caltrans staff regarding changes to the project description (Parker, pers. comm. 2009; T. Nunes, Caltrans, *in litt.* 2009a,b); and (4) information available to the Service.

Consultation History

December 16, 2004: The Service received Caltrans' initial request for formal consultation on the SR 99 Goshen to Kingsburg Six-Lane Project, Fresno and Tulare Counties, California for impacts to the beetle and kit fox. The project description included the expansion of 13.6 miles of SR 99 between Goshen and Kingsburg from a four-lane to a six-lane highway. The project description also included converting the existing metal thrie-beam guardrail (which allows kit fox passage) along the 13.6-mile project to a median barrier alternating between concrete and metal thrie-beam guardrail (except for a 0.7-mile section along a potential kit fox migration corridor near Cross Creek that would retain its metal thrie-beam guardrail).

June 23, 2005: The Service issued a biological opinion (Service file # 1-1-05-F-0040) for the SR 99 Goshen to Kingsburg Six-Lane Project for adverse affects to the beetle and kit fox (Service 2005). The biological opinion authorized the incidental take of "all San Joaquin kit foxes that inhabit areas immediately adjacent to the 13.6-mile length of road. The incidental take will be in the form of harm and harassment" (Service 2005, p. 28). The biological opinion included a term and condition minimizing impacts to the kit fox by prohibiting night-time construction work. The biological opinion also authorized the incidental take of the beetle:

The Service has determined that implementation of the proposed project will result in the incidental take of all beetles inhabiting 7 elderberry shrubs containing 84 stems measuring 1.0 inch or greater in diameter at ground level. This incidental take allowance takes into consideration the project schedule (construction will not begin for six years) and additional stem growth that may occur prior to construction. The incidental take will be in the form of death, injury, harassment, or harm (Service 2005, p. 28).

Based on the 2004 elderberry shrub surveys (Caltrans 2004), the June 2005 biological opinion (Service 2005) stated that seven shrubs containing 44 elderberry stems with a diameter at ground level of greater than 1.0 inch would be directly impacted and have to be transplanted. The June 2005 biological opinion further explained that "since the project is not expected to begin until 2010, the compensation ratios are calculated based on projected numbers of stems expected to be taken. As a result, Caltrans may plant up to 111 elderberry seedlings and 103 associated native plant species" (Service 2005, p.4). Caltrans had requested incidental take coverage for the seven elderberry shrubs surveyed in 2004 as well as any elderberry stems expected to grow before the beginning of project construction in 2010.

May 6, 2009: The Service received Caltrans' letter (Parker, *in litt.* 2009) reinitiating formal consultation for the SR 99 Goshen to Kingsburg Six-Lane Project, Fresno and Tulare Counties, California (proposed project) due to the following changes in the project description that would result in additional impacts to the kit fox and the beetle: 1) three additional elderberry shrubs would be directly impacted and need to be transplanted (in addition to the seven elderberry shrubs authorized in the original biological opinion); 2) a request that 100 days of night-time work be allowed; 3) an increase in the length of double concrete median barrier resulting in a

greater impediment to kit fox movement across 13.6 miles of SR 99 between Goshen and Kingsburg (except for an approximate 0.7-mile section near a potential kit fox migration corridor along Cross Creek).

June 29, 2009: Joseph Terry (Senior Biologist, Service, Sacramento Fish and Wildlife Office) and Zachary Parker (Central Region Biology Branch Chief, Caltrans) exchanged e-mails regarding the design specifications for the median barrier and the potential effects of the proposed double concrete median barrier on kit fox movement including an increased risk of vehicle strikes of kit fox (Parker, pers. comm. 2009). Mr. Parker clarified that there would be a total of 25 Type M concrete barrier wildlife passageway fences (2-foot long thrie-beam to allow for wildlife passage) and that each of these wildlife passageways would be placed at an average frequency of one every 0.5 mile. Mr. Parker stated that there would also be 6-inch diameter holes (Type 60/S wildlife passage fences) in the double concrete median barriers every 200 feet to allow kit fox passage. Mr. Terry responded that he did not know how effective the 6-inch holes in the median barrier would be and that kit fox would not be able to see approaching traffic through the 6-inch holes. Mr. Terry requested that the number of Type M wildlife passage fences be quadrupled to 100 and placed at an average frequency of one every 0.125 mile. Mr. Terry also requested that night-time work not be allowed within 1 mile of the kit fox dispersal corridor near Cross Creek.

July 21, 2009: Mr. Parker (Caltrans) called Mr. Terry (Service) to discuss the effects of the project on the kit fox and appropriate conservation measures, compensation, and terms and conditions (Parker, pers. comm. 2009). Mr. Parker stated that the proposed project will expand the right-of-way only near the Kings River resulting in the permanent loss of 1.94 acres of orchards and lawn at an RV park. Mr. Terry asked if Caltrans could quadruple the number of Type M wildlife passage fences (24 inches wide x 8 inches high rectangular openings) in the median barrier from 25 to 100 so that they could be placed every 0.125 mile instead of every 0.5 mile. Mr. Terry also suggested that compensation to further minimize potential impacts to kit fox from the median barrier could be the installation of wildlife passage fences in median barriers off-site in areas with a high incidence of vehicle strikes of kit fox. Mr. Parker said that Caltrans could possibly do the less expensive Type M wildlife passage structures but not the more expensive under highway crossing structures. Mr. Terry also mentioned that Caltrans may need incidental take coverage for vehicle strikes of kit fox during and post-construction of the proposed project.

August 3, 2009: Mr. Parker (Caltrans) and Mr. Terry (Service) exchanged emails regarding what Mr. Terry and Susan Jones (Service, Sacramento Fish and Wildlife Office, Endangered Species Division, San Joaquin Valley Branch Chief) had discussed would be appropriate conservation measures, terms and conditions, and to further minimize potential impacts to the kit fox due to night-time work and construction of the double concrete median barrier (Parker, pers. comm. 2009). Mr. Terry and Ms. Jones proposed the following conservation measures for kit fox:

- Compensation for night-time work could be calculated based on applying the standard 1.1:1 compensation ratio for temporary disturbance to any potential kit fox habitat occurring within 250 feet of night-time construction work (0.7-mile long Cross Creek area and any culverts under SR 99).
- There should be more of the 2-foot Type M wildlife passage fences than the 25 currently proposed in the letter reinitiating formal consultation (one every 0.5 mile) and that 100 2-foot Type M wildlife passage fences (one every 0.125 mile) would be a minimum of what is necessary to minimize the impacts of the median barrier on kit fox passage.
- Artificial dens should be installed within the median near the Type-M wildlife passage fences to provide escape cover for any kit fox trying to cross the highway.
- Off-site compensation for the double concrete median barrier could be improving kit fox passage (installing Type M wildlife passage fences, artificial dens, and/or other Service-approved kit fox passage structures) in areas with a high incidence of vehicle strikes of kit fox. Mr. Parker mentioned a database that currently tracks vehicle strikes of wildlife.
- Post-construction monitoring of the 13.6-mile long project area for vehicle strikes of kit fox should be included as a term and condition. Caltrans would then be required to immediately report to the Service and California Department of Fish and Game any vehicle strikes of kit fox and then immediately improve kit fox passage at the site by installing Type M wildlife passage fences or some other Service-approved kit fox passage structure. The biological opinion would authorize the incidental take of two kit foxes in the form of mortality due to vehicle strikes; after the second vehicle strike of kit fox, Caltrans would have to reinitiate formal consultation.

August 5, 2009: Tamra Nunes (Caltrans) sent via electronic mail to Mr. Terry the results of the July 23, 2009 elderberry surveys for the proposed project (T. Nunes, Caltrans, *in litt.* 2009a). The results are summarized in Table 1 below. The recent survey increased the total number of elderberry shrubs that would be directly impacted and have to be transplanted from seven shrubs (in the original biological opinion (Service 2005) to ten shrubs. The ten shrubs in the July 23, 2009 survey contained 42 stems with a diameter at ground level of greater than 1.0 inch that would be directly impacted by the project. Ms. Nunes stated that Caltrans would compensate for the impacts to the beetle by planting 76 elderberry stems and 82 associated native plants at the French Camp Conservation Bank or River Ranch Conservation Bank.

August 6, 2009: Mr. Terry, Jen Schofield, and Ms. Jones (Service, Sacramento Fish and Wildlife Office) had a teleconference with Mr. Parker (Caltrans) (Parker, pers. comm. 2009) to further discuss conservation measures and compensation to further minimize potential impacts of night-time work and the double concrete median barrier on kit fox. Mr. Parker calculated that based on the 1.1:1 compensation ratio for temporary disturbance from night-time work within 250 feet of kit fox habitat (Cross Creek area) that Caltrans would have to purchase about 66 acres (over \$ 1 million) and that this was too costly. Mr. Terry suggested that since the temporary disturbance associated with night-time work would last for only 10 - 20 days the compensation acreage could be prorated based on the number of nights of night-time work near kit fox habitat;

however, compensation to further minimize potential project related impacts for night-time work within 250 feet of any of the culverts under SR 99 that kit fox could use to pass under the highway could also be considered. Mr. Parker mentioned that Caltrans may not be able to install the artificial dens in the median that Mr. Terry and Ms. Jones had suggested for providing escape cover for kit fox (Mr. Parker later explained on August 18, 2009, that Caltrans has concerns about getting sued for creating habitat encouraging wildlife use of the median and then the wildlife getting killed).

August 18, 2009: Mr. Terry (Service) and Mr. Parker (Caltrans) spoke on the telephone and exchanged e-mails (Parker, pers. comm. 2009) regarding avoidance and minimization measures and compensation to further minimize potential impacts of the proposed project on the kit fox due to night-time work and the proposed double concrete median barrier. Mr. Terry and Mr. Parker agreed upon the following conservation measures:

Potential Compensation to Further Minimize Potential Impacts of Night-time Work as Discussed on August 18, 2009

Compensation for night-time work would be based on a 1.1:1 compensation ratio (the standard compensation ratio for temporary impacts to kit fox habitat) for temporary impacts to potential kit fox habitat occurring within 250 feet of night-time construction activities (0.7 mile-long Cross Creek area and a 250-foot buffer around each of the 46 culverts under SR 99 that kit fox could use to pass underneath the highway). Mr. Parker estimated that the area temporarily affected based on the 250-foot buffer around the culverts and at Cross Creek was about 60 acres. It was determined that a total of 20 nights of work would be within this 60-acre area (less than 10 nights of work would be near Cross Creek). Using these figures as a baseline for determining the amount of compensation, the following formula was used:

- (1) (60 acres of temporary disturbance) x (1.1:1 ratio) = 66 acres
- (2) (20 nights of work) / (365 days/year) = 0.055
- (3) 66 x 0.055 = 3.63 acres of compensation

Based on the above calculation of 3.63 acres of compensation, Caltrans proposes to purchase 4 credits (4 acres) from the Service-approved Sand Creek Conservation Bank to offset temporary disturbance to kit fox associated with night-time construction activities. In addition, to minimize disruption to kit fox that may attempt to cross SR 99 during construction, Caltrans will as a first order of work clean and clear all obstructed culverts located within the project limits; there are 46 culverts in the 13.6-mile segment of SR 99 of which 37 are currently obstructed with vegetation and or filled with dirt and currently unusable for wildlife passage.

Potential Minimization Measures and Compensation to Further Minimize Potential Impacts of the Double Concrete Median Barrier Implementation as Discussed on August 18, 2009

During the August 18, 2009, telephone conversation and email exchange, Mr. Terry (Service) and Mr. Parker (Caltrans) agreed to the following minimization measures and

compensation to further minimize potential impacts of the proposed double median concrete barrier on kit fox safe passage across SR 99.

- Prior to beginning construction work, dirt and vegetation would be cleared from the 37 obstructed culverts under SR 99, as stated above, to allow kit fox safe-passage under the highway.
- Only thrie-beam would be used in the median along the 0.7 mile long Cross Creek area that is a potential kit fox migration corridor (Parker *in litt.* 2009).
- One concrete barrier wildlife passageway fence (Type L) is proposed approximately 2,000 feet south of the thrie-beam fence next to Cross Creek. The fence opening of 18.5 feet will be used primarily for emergency vehicle access but will also serve as an opening for wildlife (Parker *in litt.* 2009).
- Throughout the rest of the project, a double concrete barrier wildlife passageway fence is proposed (modified Type 60/S). The originally proposed Type 60/S design will be expanded from a 6-inch radius (Parker *in litt.* 2009) to a 9-inch radius to improve kit fox passage. This modified fence type consists of a concrete barrier with 9-inch radius openings (9 inches high x 18 inches wide half-circle openings) spaced every 150 feet to allow wildlife passage. Within the median, the distance between the concrete barriers will range from 19 feet to 23 feet.
- 25 concrete barrier wildlife passageway fences (Type M) are proposed at transition areas between the Type 60 barriers. The Type M fence consists of a concrete median barrier with 24-inch long thrie-beam to allow for wildlife passage (*i.e.*, rectangular openings that are 8 inches high x 24 inches wide to be placed on average every 0.5 mile).
- Off-site modifications to the median barrier south of the proposed project to allow kit fox safe passage along a 3-mile segment of SR 99 between Goshen and Tulare: Type M wildlife passage fences (rectangular openings that are 8 inches high x 24 inches wide) will be placed every 0.5 mile and the modified Type 60/S wildlife passage openings (9 inches high x 18 inches wide half-circle openings) will be spaced every 150 feet to allow kit fox passage.

August 19-20, 2009: Mr. Parker and Ms. Nunes (Caltrans) called and spoke with Mr. Terry (Service) to clarify the number of elderberry shrubs and stems that were to be removed in the original June 2005 biological opinion for the project (Parker, pers. comm. 2009). Mr. Parker explained that Caltrans had requested incidental take coverage beyond the number of elderberry stems identified on the seven elderberry shrubs surveyed in 2004 to take into account anticipated growth of the shrubs to occur before project construction scheduled to begin in 2010. Ms. Nunes emailed Mr. Terry (Nunes *in litt.* 2009b) the tables from the November 2004 Biological Assessment for the project (Caltrans 2004) showing the number of elderberry shrubs and stems that would have been transplanted based on the 2004 surveys and the anticipated number of elderberry shrubs and stems that would need to be transplanted (estimating growth of elderberry stems) when the project is constructed in 2010. The June 2005 biological opinion (Service 2005) had mistakenly switched the number of elderberry of stems to be transplanted (27) with the

number of elderberry seedlings to be planted as mitigation (44). Mr. Parker and Ms. Nunes also explained the following changes in the elderberry shrubs between the 2004 and the 2009 surveys: 1) two large elderberry shrubs adjacent to the railroad had been completely cut back and resprouted (it is not known at this time who was responsible for cutting back the elderberry shrubs); 2) another elderberry shrub was completely gone but a new one resprouted; and 3) the project footprint had expanded to include two elderberry shrubs that Caltrans initially thought could be avoided in the 2005 biological opinion (Service 2005).

Revisions to the Project Description

The SR 99 Goshen to Kingsburg 6-Lane Project, Tulare and Fresno Counties, was originally described in the November 2004 Biological Assessment (Caltrans 2004) and the Service's June 2005 biological opinion (Service 2005). Based on the letter from Caltrans reinitiating formal consultation (Parker *in litt.* 2009) and the subsequent conversations with Caltrans staff (Parker, pers. comm. 2009; Nunes *in litt.* 2009a, b), the following revisions are made to the project description for the currently proposed project.

- The proposed project will include 100 days of night-time construction work.
- Instead of alternating metal thrie-beam guardrail and double concrete median barrier as described in the June 2005 biological opinion (Service 2005), the proposed project will include about 13.6 miles of double concrete median barrier along SR 99 between Goshen, Tulare County, and Kingsburg, Fresno County (except for a 0.7 mile stretch of highway near Cross Creek which is a potential kit fox migration corridor).
- The proposed project will directly impact ten elderberry shrubs containing a total of 42 stems with a diameter at ground level of greater than 1.0 inch (Table 1). This represents an increase in the number of shrubs but a decrease in the total number of elderberry stems with a diameter at ground level of greater than 1.0 inch that were anticipated to be directly impacted in the June 2005 biological opinion (7 shrubs containing 84 stems) (Service 2005). The conservation measures for the beetle that were included in the November 2004 Biological Assessment (Caltrans 2004) and the Service's June 2005 biological opinion (Service 2005) will be revised as discussed below to represent the change in the number of elderberry shrubs and stems that will be directly impacted.

Additional Conservation Measures for the San Joaquin Kit Fox

The following conservation measures will be added to the conservation measures identified for the kit fox in the November 2004 Biological Assessment (Caltrans 2004) and the June 2005 biological opinion (Service 2005). These additional conservation measures minimize and compensate for the effects of night-time construction work and the double concrete median barrier.

- Night-time work will be limited to 20 nights within 250 feet of potential kit fox habitat (about 60 acres total along the 0.7-mile segment near Cross Creek and near the 46 culverts under SR 99 that kit fox may attempt to use to cross underneath the highway).
- Caltrans will compensate for 20 days of night-time work within 250 feet of about 60 acres of potential kit fox habitat by purchasing 4 credits (4 acres) from the Service-approved Sand Creek Conservation Bank.
- Caltrans will as a first order of work clean and clear dirt and vegetation from all obstructed culverts underneath SR 99 located within the project limits to allow kit fox safe-passage under the highway. Currently, 37 of the 46 culverts underneath SR 99 in the project area are obstructed by dirt and vegetation and unusable by wildlife (Parker, pers. comm. 2009).
- One concrete barrier wildlife passageway fence (Type L) will be installed 2,000 feet south of the thrie-beam fence next to Cross Creek. The fence opening of 18.5 feet will be used primarily for emergency vehicle access but will also serve as an opening for wildlife (Parker *in lit.* 2009).
- Throughout the rest of the project, a double concrete barrier wildlife passageway fence will be used (a modified Type 60/S design). The modified Type 60/S design consists of a concrete barrier with 9-inch radius openings (18 inches wide x 9 inches high half-circle openings) spaced every 150 feet to allow kit fox passage. Within the median, the distance between the concrete barriers will range from 19 feet to 23 feet.
- 25 concrete barrier wildlife passageway fences (Type M) will be placed at transition areas between the modified Type 60/S barriers. The Type M fence consists of a concrete median barrier with 24-inch long thrie-beam to allow for wildlife passage (rectangular openings that are 24 inches wide x 8 inches high to be placed on average every 0.5 mile).
- To further minimize potential impacts of the construction of the double concrete median barrier, Caltrans will compensate off-site by modifying the median barrier in a 3-mile segment of SR 99 between Goshen and Tulare south of the Kingsburg to Goshen segment in the proposed project. The 3 miles of median barrier will be modified to include Type M wildlife passage fences (rectangular openings that are 24 inches wide x 8 inches high) that will be placed every 0.5 mile. Modified Type 60/S wildlife passage openings (18 inches wide x 9 inches high half-circle openings) will be spaced every 150 feet along the 3-mile section between Goshen and Tulare to allow kit fox passage.

Revised Conservation Measures for the Valley Elderberry Longhorn Beetle

The following conservation measure will be added to the conservation measures for the beetle included in the November 2004 Biological Assessment (Caltrans 2004) and the June 2005 biological opinion (Service 2005). The following conservation measure revises the number of elderberry shrubs that will be transplanted and the number of elderberry seedlings and associated native plants that will be planted at a Service-approved conservation bank.

- Ten elderberry shrubs containing a total of 42 stems with a diameter at ground level of greater than 1.0 inch that would be directly impacted by construction activities will be transplanted to a Service-approved conservation bank (French Camp Conservation Bank or River Ranch Conservation Bank). An additional 76 elderberry seedlings and 82 associated native plants will be planted at the conservation bank to compensate for impacts to the beetle (Table 1).

Table 1. Elderberry stems directly affected and proposed compensation for the Reinitiation of Formal Consultation for the Goshen to Kingsburg 6-Lane Project, Tulare and Fresno Counties.

Stem Size	# of Stems	Exit Holes	Riparian Habitat	Elderberry Seedling Ratio	# Elderberry Seedlings	Associated Native Ratio	# Associated Natives
1"-3"	0	No	Yes	2:1	0	1:1	0
1"-3"	20	No	No	1:1	20	1:1	20
1"-3"	3	Yes	No	2:1	6	2:1	12
3"-5"	1	No	Yes	3:1	3	1:1	3
3"-5"	8	No	No	2:1	16	1:1	16
>5"	1	No	Yes	4:1	4	1:1	4
>5"	9	No	No	3:1	27	1:1	27
Total	42				76		82

Effects of the Proposed Action

The following discussion adds to and revises the discussion of the effects of the proposed action included in the June 2005 biological opinion for the proposed project (Service 2005).

San Joaquin Kit Fox

As stated in the Service's original June 2005 biological opinion for the proposed project (Service 2005), kit fox may be harmed or harassed by construction activities along the 13.6-mile long project area. Because the kit fox is primarily nocturnal, the addition of night-time work to the proposed project increases the likelihood of the kit fox encountering project construction activities and being harmed or harassed. The revised proposed project includes 100 days of night-time work of which no more than 20 days of night-time work would occur within 250 feet of a potential kit fox migration corridor near Cross Creek or within 250 feet of 46 culverts

underneath SR 99 that kit fox may attempt to use to cross underneath the highway. Therefore, the potential for the kit fox being harassed or harmed due to night-time construction work will be short-term.

Kit fox mortality and injury occurs when the animals attempt to cross roads and are hit by cars, trucks, or motorcycles. The majority of strikes likely occur at night when the animals are most active. Driver visibility also is lower at night increasing the potential for strikes. Such strikes are usually fatal for an animal the size of a kit fox. Thus, vehicle strikes are a direct source of mortality for the kit fox. Therefore, night-time work increases the risk of kit fox being hit and killed by vehicles.

The impacts of night-time construction work on the kit fox will be minimized by implementing the conservation measures included in the November 2004 Biological Assessment (Caltrans 2004), the June 2005 biological opinion (Service 2005), and the conservation measures discussed above. Additionally, the impacts of 20 days of night-time work near potential kit fox habitat will be compensated for by the purchase of 4 kit fox credits (4 acres) from the Service-approved Sand Creek Conservation Bank.

In the June 2005 biological opinion for the proposed project (Service 2005), the existing metal thrie-beam guardrail was to be replaced with a guardrail that would alternate between concrete and metal thrie-beam guardrail. This median barrier design was not thought to significantly impact the ability of kit fox to move across the highway due to the length of metal thrie-beam guardrail to be incorporated in the design. The currently proposed project decreases the amount of metal thrie-beam guardrail to 2-foot Type M wildlife passage fences to be placed on average every 0.5 mile. A double concrete median barrier will be installed along about 13.6 miles of SR 99 between Goshen and Kingsburg with the following exceptions: 1) only thrie-beam will be used in the median along the 0.7-mile long Cross Creek area that is a potential kit fox migration corridor; 2) one concrete barrier wildlife passageway fence (Type L) will be installed 2,000 feet south of the thrie-beam fence next to Cross Creek with an 18.5-foot fence opening; and 3) existing bridges and box culverts would remain in place to facilitate safe kit fox crossings.

Thus, the increase in the length of double concrete median barrier along the 13.6-mile stretch of SR 99 (with the exception of the potential kit fox migration corridor at Cross Creek) decreases the ability of kit fox to safely cross the proposed 6-lane highway and increases the risk of vehicle strikes of kit fox. Caltrans, however, proposes installing the modified Type 60/S wildlife passage structures (9 inches high x 18 inches wide half-circle openings) to be spaced every 150 feet along the 13.6 miles of double concrete median barrier to reduce the risk of vehicle strikes of kit fox. Thus, the 2-foot Type M wildlife passage fences placed every 0.5 mile and the modified Type 60/S wildlife passage fences placed every 150 feet will reduce the risk of vehicle strikes of kit fox along the 13.6 miles of SR 99. Kit fox, however, would not be able to see approaching traffic through the small wildlife passage fences and could run out in front of traffic. Also, it is not known if the kit fox would use the modified Type 60/S wildlife passage structures or the Type M wildlife passage structures to cross the highway.

The impacts of the currently proposed median barrier on kit fox will also be reduced by Caltrans' commitment to clear dirt and vegetation from the 37 currently obstructed culverts under SR 99 to allow kit fox safe-passage under the highway. Additionally, Caltrans will compensate off-site for the impacts of the proposed median barrier by installing wildlife passage fences along a 3-mile stretch of SR 99 between Goshen and Tulare south of the proposed project. Caltrans will install Type M wildlife passage fences (rectangular openings that are 24 inches wide x 8 inches high) every 0.5 mile and modified Type 60/S wildlife passage openings (18 inches wide x 9 inches high half-circle openings) every 150 feet along the 3-mile section between Goshen and Tulare to allow kit fox passage across the highway.

In summary, the kit fox may be harmed or harassed during night-time construction activities. Additionally, the expansion of the highway from four lanes to six lanes combined with the installation of the double concrete median barrier increases the risk of vehicle strikes of kit fox. However, Caltrans will reduce the potential for take of the kit fox by implementing the avoidance and minimization measures discussed above and in the November 2004 Biological Assessment (Caltrans 2004) and the June 2005 biological opinion (Service 2005). Caltrans will reduce the potential for harm and harassment of the kit fox during night-time construction activities by limiting night-time construction work within 250 feet of the potential kit fox migration corridor and any of the culverts under SR 99 that kit fox may use to cross underneath SR 99 to only 20 nights. Caltrans will off-set temporary disturbance to kit fox habitat from night-time construction work by purchasing 4 kit fox credits (4 acres) from the Sand Creek Conservation Bank. Caltrans will reduce the risk of vehicle strikes of kit fox along the 13.6 miles of highway by maintaining the existing metal thrie-beam guardrail across 0.7 miles of a potential kit fox migration corridor at Cross Creek, by clearing the 37 currently obstructed culverts underneath SR 99 to allow kit fox passage underneath the highway and by installing the Type M wildlife passage structures every 0.5 mile and the modified Type 60/S wildlife passage structures every 150 feet along the 13.6 miles of SR 99. Caltrans will also off-set the impacts of the proposed median barrier on the kit fox by installing off-site Type M wildlife passage structures every 0.5 mile and the modified Type 60/S wildlife passage structures every 150 feet along a 3-mile section of SR 99 between Goshen and Tulare south of the currently proposed project area.

Valley Elderberry Longhorn Beetle

The Service's original June 2005 biological opinion for the proposed project (Service 2005) stated that there were seven elderberry shrubs containing 44 stems with a diameter of greater than 1.0 inch at ground level that would be directly affected by the proposed project and would have to be transplanted. The June 2005 biological opinion stated that there were two additional elderberry shrubs on-site that could be avoided, and, therefore, would not have to be transplanted. The June 2005 biological opinion also accounted for anticipated growth of the elderberry shrubs between the time they were surveyed in 2004 and when project construction was scheduled to begin in 2010. Taking into consideration the anticipated growth of the elderberry shrubs between 2004 and 2010, the June 2005 biological opinion authorized the incidental take of all beetles

within seven elderberry shrubs containing a total of 84 stems with a diameter at ground level of greater than 1.0 inch.

More recently, elderberry shrub surveys on July 23, 2009, for the currently proposed project found ten elderberry shrubs containing a total of 42 stems with a diameter at ground level of greater than 1.0 inch that would be directly impacted by the project and would have to be transplanted (Nunes *in litt.* 2009a). The survey results are summarized in Table 1 above. The ten shrubs contained a total of 23 stems with a diameter at ground level of between 1 – 3 inches, nine stems with a diameter of between 3 – 5 inches, and ten stems with a diameter of greater than 5 inches. Two of the shrubs are within riparian habitat. A beetle exit hole was observed on one of the non-riparian elderberry shrubs that would have to be transplanted.

Effects to the beetle may occur with the transplanting of elderberry shrubs. Loss of an elderberry shrub or even a stem can result in direct mortality of beetles or affect beetle breeding and feeding because adult beetles rely solely on elderberry flowers for food and must lay their eggs on elderberry stems to successfully reproduce. This action will adversely affect the valley elderberry longhorn beetle. Any beetle larvae occupying these plants are likely to be killed when the plants are removed. Fewer elderberry stems will have to be transplanted than were originally anticipated in the June 2005 biological opinion. Therefore, the impact of the project on the beetle will be less than what was analyzed in the June 2005 biological opinion.

The effects of the proposed project on the beetle will be minimized by following the Service's 1999 *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Guidelines) (Service 1999). The potential for take of the beetle will be reduced by avoiding construction activities during the beetle flight season and by installing buffer fencing prohibiting construction work within 20 feet of elderberry shrubs. Caltrans will off-set the impacts of the project to the beetle by transplanting the ten elderberry shrubs that occur within the construction footprint and planting 76 elderberry seedlings and 82 associated native plants at the French Camp Conservation Bank, River Ranch Conservation Bank, or another Service-approved conservation bank.

Conclusion

After reviewing the current status of the San Joaquin kit fox and the valley elderberry longhorn beetle, the environmental baseline for the action area, the effects of the proposed widening of SR 99 and changes to the median barrier in Tulare and Fresno Counties, California, and cumulative effects, it is the Service's biological opinion that the proposed project is not likely to jeopardize the continued existence of any of the above listed species, or adversely modify proposed or designated critical habitat. The proposed project is not likely to affect critical habitat for the kit fox, as none has been proposed or designated. The designated critical habitat for the valley elderberry longhorn beetle is not located within the action area, and will not be affected by the proposed project.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

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

Amount or Extent of Take

San Joaquin Kit Fox

The Service is quantifying take incidental to the project as: 1) the incidental take of all San Joaquin kit foxes that inhabit areas immediately adjacent to the 13.6-mile length of highway in the form of harm and harassment; and 2) the incidental take of two San Joaquin kit foxes in the form of mortality from vehicle strikes during or after project construction.

Valley Elderberry Longhorn Beetle

The Service has determined that implementation of the proposed project will result in the incidental take of all beetles inhabiting 10 elderberry shrubs containing 44 stems measuring 1.0 inch or greater in diameter at ground level. The incidental take will be in the form of death, injury, harassment, or harm.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the San Joaquin kit fox or the valley elderberry longhorn beetle. The conservation measures of the proposed project will reduce the likelihood of kit fox mortality resulting from an expanded highway and modified median barrier. The proposed compensation incorporated within the conservation measures to further minimize potential project related impacts will enhance the survival and recovery of the valley elderberry longhorn beetle.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the effect of the proposed project on the San Joaquin kit fox and the valley elderberry longhorn beetle.

1. Caltrans shall implement the conservation measures as described in the biological assessment (Caltrans 2004) and the June 2005 biological opinion (Service 2005) with the additions and revisions included in this current biological opinion.
2. Caltrans shall minimize adverse effects to the San Joaquin kit fox.
3. Caltrans shall minimize adverse effects to the valley elderberry longhorn beetle.
4. Caltrans shall ensure compliance with this biological opinion.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, FHWA shall ensure Caltrans complies with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

1. The following Term and Condition implements Reasonable and Prudent Measure One (1):
 - a. Caltrans shall implement the conservation measures as described in the biological assessment (Caltrans 2004) and the June 2005 biological opinion (Service 2005) with the additions and revisions included in this current biological opinion.
2. The following Terms and Conditions implement Reasonable and Prudent Measure Two (2):
 - a. Caltrans shall implement the conservation measures for the San Joaquin kit fox as described in the biological assessment (Caltrans 2004) and the June 2005

biological opinion (Service 2005) with the additions and revisions included in this current biological opinion.

- b. Night-time construction work will be allowed for no more than 100 days throughout the project area. Night-time construction work will be allowed for no more than 20 days within 250 feet of areas that may potentially be used by San Joaquin kit fox (*i.e.*, the 0.7-mile long section near Cross Creek that is a potential San Joaquin kit fox migration corridor and any of the culverts underneath SR 99 in the project area that San Joaquin kit fox might use to cross underneath the highway). Caltrans shall hire a qualified biologist to monitor all night-time construction activities occurring within 250 feet of potential San Joaquin kit fox habitat near the Cross Creek area. If a San Joaquin kit fox is observed, all construction activities must stop until the biologist reports that the San Joaquin kit fox is safely away from the project construction area and will not be harmed.
- c. Prior to beginning construction work, Caltrans shall clear dirt and vegetation from the 37 currently obstructed culverts in the project area under SR 99 (and any other obstructed culverts in the project area under SR 99) to allow kit fox safe-passage under the highway.
- d. Prior to beginning construction work, Caltrans shall compensate for impacts to the San Joaquin kit fox due to night-time construction activities by purchasing 4 credits (4 acres) from Sand Creek Conservation Bank or another Service-approved conservation bank.
- e. Caltrans shall monitor the 13.6-mile long stretch of SR 99 within the proposed project area for vehicle strikes of San Joaquin kit fox during project construction and for five years following project construction. If a vehicle strike of San Joaquin kit fox is found within the project area, then Caltrans shall immediately report the incident to the Service and to the California Department of Fish and Game. Then, Caltrans shall immediately improve the ability of San Joaquin kit fox to safely cross the highway near the site of the vehicle strike by installing Service-approved San Joaquin kit fox passage structure(s) in the median barrier and/or underneath the highway.
- f. Caltrans shall compensate off-site for the impacts of the proposed double concrete median barrier on the San Joaquin kit fox by modifying the median barrier in a 3-mile segment of SR 99 between Goshen and Tulare south of the proposed project. The 3 miles of median barrier will be modified to include Type M wildlife passage fences (rectangular openings that are 8 inches high x 24 inches wide) that will be placed every 0.5 mile. Modified Type 60/S wildlife passage openings (9 inches high x 18 inches wide half-circle openings) will be spaced every 150 feet along the 3-mile section between Goshen and Tulare to allow kit

fox passage. Any further changes to the design of the San Joaquin kit fox passage structures proposed in the median barrier must be approved by the Service.

3. The following Term and Condition implements Reasonable and Prudent Measure Three (3):
 - a. Caltrans shall implement the conservation measures for the valley elderberry longhorn beetle as described in the biological assessment (Caltrans 2004) and the June 2005 biological opinion (Service 2005) with the additions and revisions included in this current biological opinion.
 - b. Caltrans shall transplant the ten (10) elderberry shrubs within the project area that would be directly impacted by construction activities to a Service-approved conservation bank. Caltrans shall compensate for impacts to the valley elderberry longhorn beetle by planting 76 elderberry seedlings and 82 associated native plants at French Camp Conservation Bank, River Ranch Conservation Bank, or another Service-approved conservation bank.
 - c. Caltrans shall follow the Service's *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Service 1999).
4. The following Terms and Conditions implement Reasonable and Prudent Measure Four (4):
 - a. If requested, before, during, or upon completion of ground breaking and construction activities, Caltrans shall allow access by Service and/or California Department of Fish and Game personnel to the project site to inspect project effects to the San Joaquin kit fox, the valley elderberry longhorn beetle, and their respective habitats.
 - b. Caltrans shall comply with the *Reporting Requirements* of this biological opinion.

Reporting Requirements

1. A post-construction report detailing compliance with the project design criteria described under the *Description of the Proposed Action* section of this biological opinion shall be provided to the Service within 30 calendar days of completion of the project.
2. Caltrans shall notify the Service via electronic mail and telephone within one (1) working day of the death or injury to a listed species that occurs due to project-related activities, or is observed at the project site. Notification must include the date, time, location of the incident or of the finding of a dead or injured animal, and photographs of the specific animal. In the case of an injured animal, the animal shall be cared for by a licensed

veterinarian or other qualified person. In the case of a dead animal, the individual animal should be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or the Service takes custody of the specimen. The Service contacts are Kenneth Sanchez, Assistant Field Supervisor, Endangered Species Division, Sacramento, at (916) 414-6600, and Daniel Crum, Resident Agent-in-Charge of the Service's Law Enforcement Division at (916) 414-6660. The California Department of Fish and Game contact is Ron Schlorff at (916) 654-4262.

Any contractor or employee who, during routine operations and maintenance activities inadvertently kills or injures a State-listed wildlife species shall report within one (1) working day the incident to her or his supervisor or representative. The supervisor or representative must contact the California Department of Fish and Game immediately in the case of a dead or injured State-listed wildlife species. The California Department of Fish and Game contact for immediate assistance is State Dispatch at (916) 445-0045.

CONSERVATION RECOMMENDATIONS

Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and databases. Our conservation recommendations are as follows:

1. The FHWA and Caltrans should implement the conservation recommendations included in the Service's June 2005 biological opinion (Service 2005) and the conservation recommendations listed below.
2. The FHWA and Caltrans should monitor and identify areas with a high incidence of vehicle strikes of the San Joaquin kit fox and install Service-approved kit fox passage structures that reduce the risk of vehicle strikes. FHWA and Caltrans should inform the Service and California Department of Fish Game about the areas that have the highest incidence of vehicle strikes of listed species and other wildlife.
3. FHWA and Caltrans should comply with Executive Order 13186 by ensuring "that agency plans and actions promote programs and recommendations of comprehensive migratory bird planning efforts such as Partners-in-Flight, U.S. National Shorebird Plan, North American Waterfowl Management Plan, North American Colonial Waterbird Plan, and other planning efforts, as well as guidance from other sources" (66 FR 3853). FHWA and Caltrans should follow the recommendations in the bird conservation plans developed by California Partners in Flight, Central Valley Joint Venture, and Riparian Habitat Joint Venture for restoring and managing wetland, riparian, grassland, oak woodland, chaparral, and coniferous forest habitats for migratory birds (*e.g.*, Central Valley Joint Venture 2006; Riparian Habitat Joint Venture 2004; California Partners in

Flight 2000, 2002a, 2002b, 2004). FHWA and Caltrans should also develop a Memorandum of Understanding with the Service for the protection of migratory birds as required by Executive Order 13186.

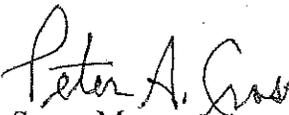
In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendation.

REINITIATION – CLOSING STATEMENT

This concludes formal consultation on the State Route 99 Goshen to Kingsburg 6-Lane Project, Tulare and Fresno Counties, California, as outlined in the request and associated documents. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this biological opinion on the proposed State Route 99 Goshen to Kingsburg 6-Lane Project, Tulare and Fresno Counties, California, please contact Joseph Terry or Susan Moore, Chief of our San Joaquin Valley Branch, at (916) 414-6630.

Sincerely,


Susan Moore
for Field Supervisor

Enclosure:

June 2005 Formal Consultation for the State Route 99 Goshen to Kingsburg Six-Lane Project, Fresno and Tulare Counties (Service file number 1-1-05-F-0040; Service 2005)

cc:

Zachary Parker, California Department of Transportation, Fresno, California
Julie Vance, California Department of Fish and Game, Fresno, California

Literature Cited

- California Department of Transportation (Caltrans). 2004. Goshen to Kingsburg Six-Lane Project Biological Assessment. November. Prepared by Geoffrey Gray, Caltrans, Fresno, California.
- California Partners in Flight. 2000. Version 1.0. The draft grassland bird conservation plan: a strategy for protecting and managing grassland habitats and associated birds in California (B. Allen, lead author). Point Reyes Bird Observatory, Stinson Beach, CA. Available on the internet at <<http://www.prbo.org/calpif/plans.html>>. Accessed on August 20, 2009.
- California Partners in Flight. 2002a. Version 2.0. The oak woodland bird conservation plan: a strategy for protecting and managing oak woodland habitats and associated birds in California (S. Zack, lead author). Point Reyes Bird Observatory, Stinson Beach, CA. Available on the internet at <<http://www.prbo.org/calpif/plans.html>>. Accessed on August 20, 2009.
- California Partners in Flight. 2002b. Version 1.0. The draft coniferous forest bird conservation plan: a strategy for protecting and managing coniferous forest habitats and associated birds in California (J. Robinson and J. Alexander, lead authors). Point Reyes Bird Observatory, Stinson Beach, CA. Available on the internet at <<http://www.prbo.org/calpif/pdfs/conifer.v-1.pdf>>. Accessed on August 20, 2009.
- California Partners in Flight. 2004. Version 2.0. The Coastal Scrub and Chaparral Bird Conservation Plan: a Strategy for Protecting and Managing Coastal Scrub and Chaparral Habitats and Associated Birds in California (J. Lovio, lead author). PRBO Conservation Science, Stinson Beach, CA. Available on the internet at <<http://www.prbo.org/calpif/plans.html>>. Accessed on August 20, 2009.
- Central Valley Joint Venture. 2006. Central Valley Joint Venture Implementation Plan—Conserving Bird Habitat. U.S. Fish and Wildlife Service, Sacramento, CA. Available on the internet at <http://www.centralvalleyjointventure.org/materials/CVJV_fnl.pdf>. Accessed on August 20, 2009.
- Riparian Habitat Joint Venture (RHJV). 2004. The riparian bird conservation plan: a strategy for reversing the decline of riparian associated birds in California. California Partners in Flight. Available on the internet at <http://www.prbo.org/calpif/pdfs/riparian_v-2.pdf>. Accessed on August 20, 2009.
- U.S. Fish and Wildlife Service (Service). 1999. Conservation Guidelines for the Valley Elderberry Longhorn Beetle. Sacramento Fish and Wildlife Office, Sacramento, California. Available on the internet at <http://www.fws.gov/sacramento/es/documents/velb_conservation.pdf>. Accessed on July 23, 2009.

U.S. Fish and Wildlife Service (Service). 2005. Formal Consultation for the State Route 99 Goshen to Kingsburg Six-Lane Project, Fresno and Tulare Counties, California. Service file number 1-1-05-F-0040. Sacramento Fish and Wildlife Office, Sacramento, California.

In Litt. References

Parker, Zachary. 2009. Central Region Biology Branch Chief, California Department of Transportation (Caltrans), Fresno, California. Letter addressed to Susan Jones, U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Endangered Species Division, San Joaquin Valley Branch, Sacramento, California, dated April 30, 2009 (received May 6, 2009). Subject: Reinitiation of Formal Consultation for the Goshen to Kingsburg 6-Lane Project, Tulare and Fresno Counties (FRE/TUL-99-PM FRE R0.0/R1.0; TUL 41.3/R53.9) (Service file # 1-1-05-F-0040).

Nunes, Tamra M. 2009a. Associate EP/Biologist, Central Region Biology Branch, California Department of Transportation (Caltrans), Fresno, California. Electronic mail addressed to Joseph Terry, U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, California, dated August 5, 2009. Subject: Revised elderberry count surveys for the Goshen to Kingsburg 6-Lane Project, Tulare and Fresno Counties.

Nunes, Tamra M. 2009b. Associate EP/Biologist, Central Region Biology Branch, California Department of Transportation (Caltrans), Fresno, California. Electronic mail addressed to Joseph Terry, U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, California, dated August 20, 2009. Subject: Elderberry count surveys in the 2004 Biological Assessment for the Goshen to Kingsburg 6-Lane Project, Tulare and Fresno Counties.

Personal Communications

Parker, Zachary. 2009. Central Region Biology Branch Chief, California Department of Transportation (Caltrans), Fresno, California. Multiple telephone conversations and electronic mail exchanges with Joseph Terry, Senior Biologist, U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, June 29 - August 20, 2009. Subject: Conservation measures for San Joaquin kit fox and valley elderberry longhorn beetle in the Reinitiation of the Goshen to Kingsburg 6-Lane Project, Tulare and Fresno Counties.

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. FRITZ HOFFMAN
Bridge Design Branch 06
Office of Bridge Design – Central
Division of Engineering Services

Date: June 8, 2009
File: 06-TUL-99-52.5
EA: 06-324501
Kings River Bridge
46-0267
(replace)

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Foundation Recommendations

Introduction

Per your request, we are providing foundation recommendations for the bridge project referenced above. This bridge is part of the Goshen to Kingsburg widening project. This report is for use by the project design engineer, construction personnel, bidders and contractors.

Pertinent Plans and Data

The following resources were used in the assessment of the site conditions for these recommendations:

1. The general and foundation plans for the proposed replacement bridge.
2. A foundation investigation report dated May 27, 1983 by this Office.
3. As- built exploratory borings (LOTB) for the original bridge structure done in 1955.
4. Exploratory borings performed in 1983 for the structure modification.
5. Caltrans Seismic Hazard Map 1996.
6. Pile driving records for the bridge modification constructed in 1984-85.

Site Geology

The subsurface formations in the project area are alluvium and flood plain deposits. These materials consist of primarily granular interbedded sands, silts, clayey silts, silty sands and minor amounts of clay. These deposits vary in consistency from loose near the surface to very dense at depth.

Groundwater

Groundwater was encountered in all of the exploratory borings. The site is situated within the Kings River. The design groundwater level is considered to be the finish grade elevation of the bent supports and will be a factor during construction.

Seismicity

Based on the 1996 Caltrans Seismic Hazard Map, the controlling fault for the project alignment is the Coast Ranges-Sierran Block Boundary Zone Fault (reverse). This fault possesses a Maximum Credible Earthquake moment magnitude of $M_w = 7.0$, and is located approximately 47 miles from the project site to the west. Based on the referenced map, the peak bedrock acceleration for the new bridge is estimated to be 0.2g. The soil profile is classified as type "D" per the Department's Seismic Design Criteria (SDC). The ARS curve is attached (Figure 1).

Liquefaction Potential

Liquefaction potential is considered to be negligible per the analysis done by this Office.

Surface Fault Rupture Hazard

Surface fault rupture is defined as displacement that occurs along the surface trace of a fault. The site is not located within any Earthquake Fault Zone (EFZ) as defined by the California Department of Conservation (Special Publication 42, 1997). There are no known faults crossing beneath or extending directly toward the site. Therefore, the potential hazard due to ground rupture is considered to be very low.

Corrosivity

Due to the very granular nature of the subsurface soils the foundation materials should be considered to be non-corrosive to construction materials or structural elements.

Scour

Per the Final Hydraulic Report by Structure Hydraulics for the new structure, there is a possible local scour condition at the new supports to elevation 262 feet. This condition has been incorporated into the foundation design.

Geotechnical Recommendations

Based on the previous foundation investigations, review of the general and foundation plans and structural engineering requirements, 48 inch diameter cast-in-steel-shell piles (CISS) with steel shell thicknesses of 0.75 inch and standard Class 140, Alternative X piles are the optimum foundation types for the bent and abutment supports, respectively. Tables 1 and 2 list the foundation recommendation parameters. Table 3 lists the finalized pile data table to be included in the project contract documents.

Table 1. Foundation Recommendations for Abutments
 PC/PS Standard Class 140, Alternative "X"

Abutment Foundation Design Recommendations									
Support Location	Pile Type	Cut-off Elevation (ft)	LRFD Service-I Limit State Load Per Support (kips)		LRFD Service-I Limit State Total Load Per Pile (kips)	Nominal Resistance (kips)	Design Tip Elevations ^{3,4} (ft)	Specified Tip Elevation ⁵ (ft)	Nominal Driving Resistance Required (kips)
			Total	Permanent	Compression				
Abut 1	Class 140 Alt. X	286.2	4370	3320	125	250	230.0 (a)	230.0	250
Abut 5	Class 140 Alt. X	286.7	4370	3320	125	250	245.0 (a)	245.0	250

Notes: (a) Design tip elevations are controlled by compression.

Table 2. Foundation Recommendations for Piers/Bents
 48 inch diameter CISS

Bent Foundation Design Recommendations											
Support Location	Pile Type	Cut-off Elevation (ft)	Service Limit State I Load (kips)	Total Permissible Support Settlement (inches)	Required Factored Nominal Resistance (kips)				Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
					Strength Limit		Extreme Event				
					Comp. $\phi=0.7$	Tension $\phi=0.7$	Comp. $\phi=1.0$	Tension $\phi=1.0$			
Bent 2 Columns 1,2,5,6	CISS NPS 48x0.75	N/A	1330	1	2300	0	1163	0	148.0 (a)	148.0	3285
Bent 2 Columns 3,4	CISS NPS 48x0.75	N/A	1096	1	1880	0	811	0	170.0 (a)	170.0	2685
Bent 3 Columns 1,2,5,6	CISS NPS 48x0.75	N/A	1359	1	2300	0	1274	0	148.0 (a)	148.0	3285
Bent 3 Column 3,4	CISS NPS 48x0.75	N/A	1131	1	1880	0	746	0	170.0 (a)	170.0	2685
Bent 4 Columns 1,2,5,6	CISS NPS 48x0.75	N/A	1324	1	2300	0	1147	0	148.0 (a)	148.0	3285
Bent 4 Columns 3,4	CISS NPS 48x0.75	N/A	1092	1	1880	0	702	0	170.0 (a)	170.0	2685

Note: (a) Design tip elevations are controlled by compression.

Table 3. Pile Data Table

Support Location	Pile Type (ft)	Nominal Resistance (kips)		Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
		Compression	Tension			
Abut 1	Class 140, Alt. X	250	N/A	230.0 (a)	230.0	250
Bent 2 Columns 1,2,5,6	CISS NPS 48x0.75	3285	0	148.0 (a)	148.0	3285
Bent 2 Columns 3,4	CISS NPS 48x0.75	2685	0	170.0 (a)	170.0	2685
Bent 3 Columns 1,2,5,6	CISS NPS 48x0.75	3285	0	148.0 (a)	148.0	3285
Bent 3 Column 3,4	CISS NPS 48x0.75	2685	0	170.0 (a)	170.0	2685
Bent 4 Columns 1,2,5,6	CISS NPS 48x0.75	3285	0	148.0 (a)	148.0	3285
Bent 4 Columns 3,4	CISS NPS 48x0.75	2685	0	170.0 (a)	170.0	2685
Abut. 5	Class 140, Alt. X	250	N/A	245.0 (a)	245.0	250

Note: (a) Design tip elevations are controlled by compression.

Load Testing Procedure

Due to the high vertical variability of the site soil conditions and to verify the capacity of the recommended piles, we also recommend that an axial load test be performed. This load test should be performed on one non-production, 48 inch diameter, CISS pile in close proximity to Bent 4, Columns 3 and 4 of the new structure. This work should take place at the beginning of the construction process at Stage 1.

Reaction piles used for the load testing of the CISS piles shall be the same materials used for the production piles. It is proposed to utilize two CISS production piles as reaction piles for the load test. These piles are located at Bent 4, Columns 3 and 4. Two driven reaction piles will be required. The specified tip elevation for the reaction piles should be 173 feet.

In addition to the load test pile, the load test reaction piles shall be dynamically monitored while they are being driven. A drivability study is being conducted by this office for proper hammer required.

The load test shall be performed for a nominal load of 3285 kips.

An additional 8.0 feet of pile stick up length must be provided to permit Pile Dynamic Analysis (PDA) monitoring. The additional 8.0 feet of length may be cut off to trim the pile to the required elevation for the pile load test.

The load testing shall be performed on the test pile following completion of interior clean out. The structure design engineer will determine the required clean-out depth for lateral demand. Ground water is anticipated during soil plug cleanout and static hydraulic pressure must be maintained in the pile to prevent quick soil conditions. Pile load testing is to be performed for compression only. A set-up period of 24 hours is required after driving both the test and anchor piles before the load test can be performed. A re-strike shall be performed on the test pile on day 1 and day 8 after the initial installation of the test pile.

After completion of the pile load test and dynamic monitoring using wave equation analysis, pile acceptance criteria will be developed by the Caltrans Foundation Testing Branch.

After the load testing is complete and the pile has been accepted, the two production piles at Bent 4, Columns 3 and 4 will be incorporated into the new bridge foundation, and the test pile and the other two reaction piles will be abandoned in accordance with the Special Provisions. The design and specifications of the pile load test to be included in the contract plans will be developed by the Office of Geotechnical Support, Foundation Testing Branch. Please contact Brian Liebich, P.E. at (916) 227- 1000 for further information.

Construction Considerations

1. Ground water was encountered during drilling of the test borings at the time of drilling. Ground water levels are subject to seasonal fluctuations and may occur at higher or lower elevations depending on the conditions at any particular time.
2. Ground water is not expected to be encountered during the excavations for Abutment 1 and 5.
3. Prior to installing driven piling, the Contractor shall provide a pile driving system submittal. All proposed driving systems (i.e. each hammer that may be brought onto the site) will be included in the submittal for Caltrans review.

4. For the load test pile, pile re-strikes by PDA monitoring shall be required on day 1 and day 8 following installation and after a 24-hour set-up period. Driving operations shall be suspended a minimum of 3.5 feet above the specified tip elevation prior to the day 1 re-strike and approximately 1.5 feet above the specified tip elevation prior to the day 8 re-strike, as directed by the Engineer. The total pile setup period shall be considered to be 8 days.
5. A soil plug at least 18 pile diameters in length shall remain undisturbed in the steel shells during clean out for the installation of the cage reinforcement to assure the geotechnical capacity. If this amount of remaining soil prevents the placement of structurally required steel reinforcement and concrete, this Office should be notified to determine if these recommendations will also change.
6. Steel shells shall be sealed at the top of the remaining soil plug in conformance with the provisions in Section 51-1.10 of the Standard Specifications.

If any conceptual changes are proposed during final project design, the Office of Geotechnical Design-North should review those changes to determine if the recommendations contained herein are still applicable.

Project Information

Standard Special Provision S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plans are:

- 1) As-Built Log of Test Borings, 2 sheets, (1955 and 1983)
- 2) Log of Test Borings (2009).
- 3) This report.

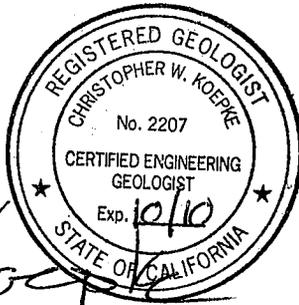
Data and information included in the Information Handout provided to the bidders and contractors are: None.

Data and information available for inspection at the District Office: None.

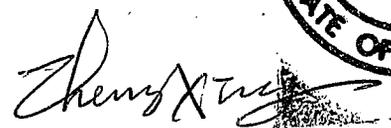
Data and information available for inspection at the Transportation Laboratory are: None.

If you have any questions or need additional information please contact Christopher Koepke at (916) 227-1040.

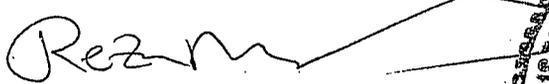
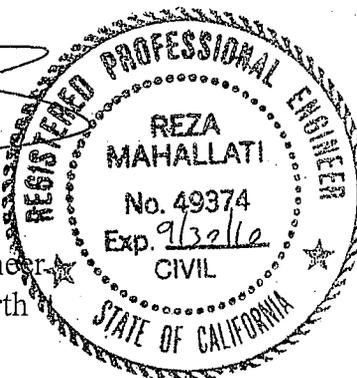
Report by:

Christopher Koepke, C.E.G. 2207
Engineering Geologist
Office of Geotechnical Design – North




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Engineering Geologist
Office of Geotechnical Design – North

Reza Mahallati, P.E.
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Office of Geotechnical Design – North

- cc:
- LAN Engineering
 - John Huang
 - R.E., Pending
 - Structures OE (E-copy)
 - D06 PCE – Peggy Lim
 - D06 DME – Ron Sekhon
 - GDN File
 - GS File Room

Memorandum

*Flex your power!
Be energy efficient!*

To: FRITZ HOFFMAN
Bridge Design Branch 06
Office of Bridge Design – Central
Division of Engineering Services

Date: February 17, 2009
File: 06-FRE-99-0.46
EA: 06-324501
Draper Street UC
42-0224 (R/L)
(widen)

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Foundation Recommendations

Introduction

Per your request, we are providing foundation recommendations for the bridge widening project referenced above. This bridge is part of the Goshen to Kingsburg widening project. This report is for use by the project design engineer, construction personnel, bidders and contractors.

Pertinent Plans and Data

The following resources were used in the assessment of the site conditions for these recommendations:

1. The general and foundation plans for the proposed bridge widening.
2. As-built exploratory borings (LOTB) for the original bridge structure done in 1961.
3. Regional groundwater level data, Well No. 16S22E21R001M (2008) and Well No. 16S22E16A001M (1995), Department of Water Resources (DWR), California.
4. Caltrans Seismic Hazard Map 1996.

Site Geology

The subsurface formations in the project area are alluvium and flood plain deposits. These materials consist of primarily granular interbedded sands, silts, clayey silts, silty sands and minor amounts of clay. These deposits vary in consistency from loose to very dense.

Groundwater

Groundwater was encountered in all of the exploratory borings done in 1961 for the original bridge. More recent data from DWR records indicate that groundwater was measured at a depth of 32 feet below the existing ground surface in the project area and may be a factor during construction of CIDH pile foundations. Groundwater elevations are subject to seasonal fluctuations and depend on local conditions at the time of construction.

Seismicity

Based on the 1996 Caltrans Seismic Hazard Map, the controlling fault for the project alignment is the Coast Ranges-Sierran Block Boundary Zone Fault (reverse). This fault possesses a Maximum Credible Earthquake magnitude of $M_w = 7.0$, and is located approximately 47 miles from the project site to the west. Based on the referenced map, the peak bedrock acceleration for the new bridge is estimated to be 0.2g. The soil profile is classified as type "D" per the Department's Seismic Design Criteria (SDC).

Liquefaction Potential

The site is not located in an area shown as potentially liquefiable on the State Seismic Hazard Map. Liquefaction potential is considered to be low per the analysis done by the Structure Foundation Branch of this Office, April 5, 1999.

Surface Fault Rupture Hazard

Surface fault rupture is defined as displacement that occurs along the surface trace of a fault. The site is not located within any Earthquake Fault Zone (EFZ) as defined by the California Department of Conservation (Special Publication 42, 1997). There are no known faults crossing beneath or extending directly toward the site. Therefore, the potential hazard due to ground rupture is considered to be very low.

Corrosivity

Due to the granular nature of the subsurface soils the foundation materials should be considered to be non-corrosive to construction materials or structural elements.

Scour

The bridge site will not be subjected to scour.

Geotechnical Recommendations

Based on the previous foundation investigations, review of the general and foundation plans and structural engineering requirements, 24 inch diameter Cast-In-Drilled-Hole (CIDH) piles are the optimum foundation type for all support locations. Tables 1 and 2 list the foundation recommendation parameters. Table 3 is the pile data table to be included in the project contract documents.

Table 1. Foundation Recommendations for Abutments
 24 inch diameter CIDH

Abutment Foundation Design Recommendations									
Support Location	Pile Type	Cut-off Elevation (ft)	LRFD Service-I Limit State Load Per Support (kips)		LRFD Service-I Limit State Total Load Per Pile (kips)	Nominal Resistance (kips)	Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
			Total	Permanent	Compression				
Abut 1	24 inch Ø CIDH	308.5	710	288	95	190	260.0 (a)	260.0	N/A
Abut 4	24 inch Ø CIDH	308.5	710	288	95	190	260.0 (a)	260.0	N/A

Notes: 1) Design tip elevations are controlled by (a) compression.

Table 2. Foundation Recommendations for Piers/Bents
 24 inch diameter CIDH

Bent Foundation Design Recommendations											
Support Location	Pile Type	Cut-off Elevation (ft)	Service Limit State I Load (kips)	Total Permissible Support Settlement (inches)	Required Factored Nominal Resistance (kips)				Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
					Strength Limit		Extreme Event				
					Comp. $\phi=0.7$	Tension $\phi=0.7$	Comp. $\phi=1.0$	Tension $\phi=1.0$			
Pier 2	24 inch Ø CIDH	293.8	3772	1	178	0	90	0	250.0 (a)	250.0	N/A
Pier 3	24 inch Ø CIDH	293.8	3772	1	178	0	90	0	250.0 (a)	250.0	N/A

Notes: 1) Design tip elevations are controlled by (a) compression.

Table 3. Pile Data Table

Support Location	Pile Type (ft)	Nominal Resistance (kips)		Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
		Compression	Tension			
Abut 1	24 inch Ø CIDH	190	N/A	260.0 (a)	260.0	N/A
Pier 2	24 inch Ø CIDH	260	0	250.0 (a)	250.0	N/A
Pier 3	24 inch Ø CIDH	260	0	250.0 (a)	250.0	N/A
Abut 4	24 inch Ø CIDH	190	N/A	260.0 (a)	260.0	N/A

Notes: 1) Design tip elevations are controlled by (a) compression.

Construction Considerations

The calculated geotechnical capacity of the CIDH piles is based on skin friction only.

Groundwater is present in recent water well data and may be encountered during construction of the CIDH piles. Simple dewatering of the CIDH excavations by pumping methods prior to the placement of concrete is to be considered feasible if groundwater is encountered.

If any conceptual changes are proposed during final project design, the Office of Geotechnical Design-North should review those changes to determine if the recommendations contained herein are still applicable.

Project Information

Standard Special Provision S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plans are:

- 1) As-Built Log of Test Borings (1961).
- 2) This report.

Data and information included in the Information Handout provided to the bidders and contractors are:

None.

Data and information available for inspection at the District Office:

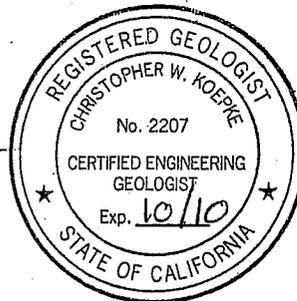
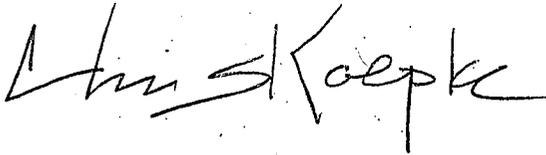
None.

Data and information available for inspection at the Transportation Laboratory are:

None.

If you have any questions or comments, or need additional information please contact Christopher Koepke at (916) 227-1040.

Report by:



Christopher Koepke, C.E.G.
Engineering Geologist
Office of Geotechnical Design – North
Branch E

cc: Qiang Huang
R.E., Pending
Structures OE (E-copy)
D06 PCE – Peggy Lim
D06 DME – Ron Sekhon
GDN File
GS File Room

Memorandum

*Flex your power!
Be energy efficient!*

To: FRITZ HOFFMAN
Bridge Design Branch 06
Office of Bridge Design – Central
Division of Engineering Services

Date: February 17, 2009
File: 06-TUL-99-45.70
EA: 06-324501
Cross Creek Bridge
46-0034 (R/L)
(replace right)
(widen left)

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Foundation Recommendations

Introduction

Per your request, we are providing foundation recommendations for the culvert replacement and widening project referenced above. This culvert is part of the Goshen to Kingsburg widening project. This report is for use by the project design engineer, construction personnel, bidders and contractors.

Pertinent Plans and Data

The following resources were used in the assessment of the site conditions for these recommendations:

1. The general and foundation plans for the proposed culvert replacement/widening.
2. As-built exploratory borings (LOTB) for the original bridge structure done in 1970.
3. Regional groundwater level data, Well No. 16S22E21R001M (2008) and Well No. 16S22E16A001M (1995), Department of Water Resources (DWR), California.
4. Caltrans Seismic Hazard Map 1996.

Site Geology

The subsurface formations in the project area are alluvium and flood plain deposits. These materials consist of primarily granular interbedded sands, silts, clayey silts, silty sands and minor amounts of clay. These deposits vary in consistency from medium dense to dense.

Groundwater

Groundwater was encountered in the exploratory borings done in 1970 for the original bridge at an elevation of approximately 262 feet. More recent data from DWR records indicate that groundwater was measured at a depth of 32 feet below the existing ground surface in the project area. Groundwater is not expected to be a factor during construction if deep foundations are not utilized.

Seismicity

Based on the 1996 Caltrans Seismic Hazard Map, the controlling fault for the project alignment is the Coast Ranges-Sierran Block Boundary Zone Fault (reverse). This fault possesses a Maximum Credible Earthquake magnitude of $M_w = 7.0$; and is located approximately 47 miles from the project site to the west. Based on the referenced map, the peak bedrock acceleration for the new bridge is estimated to be 0.2g. The soil profile is classified as type "D" per the Department's Seismic Design Criteria (SDC).

Liquefaction Potential

The site is not located in an area shown as potentially liquefiable on the State Seismic Hazard Map. The subsurface materials are medium dense to dense. Liquefaction potential is considered to be low.

Surface Fault Rupture Hazard

Surface fault rupture is defined as displacement that occurs along the surface trace of a fault. The site is not located within any Earthquake Fault Zone (EFZ) as defined by the California Department of Conservation (Special Publication 42, 1997). There are no known faults crossing beneath or extending directly toward the site. Therefore, the potential hazard due to ground rupture is considered to be very low.

Corrosivity

Due to the granular nature of the subsurface soils the foundation materials should be considered to be non-corrosive to construction materials or structural elements.

Scour

The bridge site will not be subjected to scour.

Geotechnical Recommendations

The optimum foundation type from a geotechnical perspective is spread footings.

The proposed replacement/widening should be supported on spread footings sized using a maximum allowable bearing pressure of 3.0 ksf. The spread footings should be at least 2 feet wide and embedded at least 3 feet below existing ground surface or finished grade, whichever is deeper.

Table 1 lists the spread footing data to be incorporated into the contract plans.

Table 1. Spread Footing Data Table

Support Location	Allowable Bearing Capacity (ksf)	Nominal Bearing Capacity (ksf)
ALL	3.0	6.0

Construction Considerations

All spread footing excavations are to be inspected and approved by the Engineer prior to the placement of reinforcing steel.

If any conceptual changes are proposed during final project design, the Office of Geotechnical Design-North should review those changes to determine if the recommendations contained herein are still applicable.

Project Information

Standard Special Provision S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plans are:

- 1) As-Built Log of Test Borings (1970).
- 2) This report.

Data and information included in the Information Handout provided to the bidders and contractors are:

None.

Data and information available for inspection at the District Office:

None.

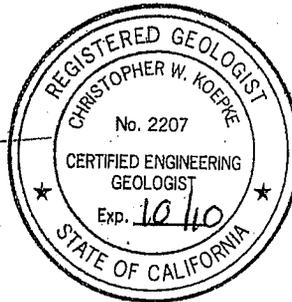
Data and information available for inspection at the Transportation Laboratory are:

None.

If you have any questions or comments, or need additional information please contact Christopher Koepke at (916) 227-1040.

Report by:

Chris Koepke



Christopher Koepke, C.E.G.
Engineering Geologist
Office of Geotechnical Design – North
Branch E

cc: Qiang Huang
R.E., Pending
Structures OE (E-copy)
D06 PCE – Peggy Lim
D06 DME – Ron Sekhon
GDN File
GS File Room

Memorandum

*Flex your power!
Be energy efficient!*

To: FRITZ HOFFMAN
Bridge Design Branch 06
Office of Bridge Design – Central
Division of Engineering Services

Date: February 17, 2009
File: 06-TUL-99-44.89
EA: 06-324501
Cross Creek Bridge
46-0033 (R/L)
(widen)

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Foundation Recommendations

Introduction

Per your request, we are providing foundation recommendations for the culvert widening project referenced above. This culvert is part of the Goshen to Kingsburg widening project. This report is for use by the project design engineer, construction personnel, bidders and contractors.

Pertinent Plans and Data

The following resources were used in the assessment of the site conditions for these recommendations:

1. The general and foundation plans for the proposed culvert widening.
2. As-built exploratory borings (LOTB) for the original bridge structure done in 1970.
3. Regional groundwater level data, Well No. 16S22E21R001M (2008) and Well No. 16S22E16A001M (1995), Department of Water Resources (DWR), California.
4. Caltrans Seismic Hazard Map 1996.

Site Geology

The subsurface formations in the project area are alluvium and flood plain deposits. These materials consist of primarily granular interbedded sands, silts, clayey silts, silty sands and minor amounts of clay. These deposits vary in consistency from medium dense to dense.

Groundwater

Groundwater was encountered in the exploratory borings done in 1970 for the original bridge at an elevation of approximately 260 feet. More recent data from DWR records indicate that groundwater was measured at a depth of 32 feet below the existing ground surface in the project area. Groundwater is not expected to be a factor during construction if deep foundations are not utilized.

Seismicity

Based on the 1996 Caltrans Seismic Hazard Map, the controlling fault for the project alignment is the Coast Ranges-Sierran Block Boundary Zone Fault (reverse). This fault possesses a Maximum Credible Earthquake magnitude of $M_w = 7.0$, and is located approximately 47 miles from the project site to the west. Based on the referenced map, the peak bedrock acceleration for the new bridge is estimated to be 0.2g. The soil profile is classified as type "D" per the Department's Seismic Design Criteria (SDC).

Liquefaction Potential

The site is not located in an area shown as potentially liquefiable on the State Seismic Hazard Map. The subsurface materials are medium dense to dense. Liquefaction potential is considered to be low.

Surface Fault Rupture Hazard

Surface fault rupture is defined as displacement that occurs along the surface trace of a fault. The site is not located within any Earthquake Fault Zone (EFZ) as defined by the California Department of Conservation (Special Publication 42, 1997). There are no known faults crossing beneath or extending directly toward the site. Therefore, the potential hazard due to ground rupture is considered to be very low.

Corrosivity

Due to the granular nature of the subsurface soils the foundation materials should be considered to be non-corrosive to construction materials or structural elements.

Scour

The bridge site will not be subjected to scour.

Geotechnical Recommendations

The optimum foundation type from a geotechnical perspective is spread footings.

The proposed widening should be supported on spread footings sized using a maximum allowable bearing pressure of 3.0 ksf. The spread footings should be at least 2 feet wide and embedded at least 3 feet below existing ground surface or finished grade, whichever is deeper.

Table 1 lists the spread footing data to be incorporated into the contract plans.

Table 1. Spread Footing Data Table

Support Location	Allowable Bearing Capacity (ksf)	Nominal Bearing Capacity (ksf)
ALL	3.0	6.0

Construction Considerations

All spread footing excavations are to be inspected and approved by the Engineer prior to the placement of reinforcing steel.

If any conceptual changes are proposed during final project design, the Office of Geotechnical Design-North should review those changes to determine if the recommendations contained herein are still applicable.

Project Information

Standard Special Provision S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plans are:

- 1) As-Built Log of Test Borings (1970).
- 2) This report.

Data and information included in the Information Handout provided to the bidders and contractors are:

None.

Data and information available for inspection at the District Office:

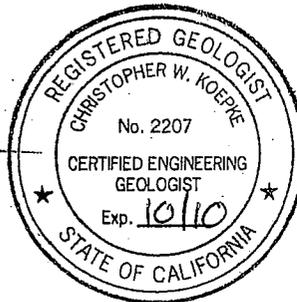
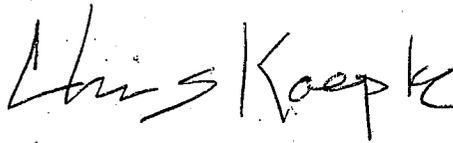
None.

Data and information available for inspection at the Transportation Laboratory are:

None.

If you have any questions or comments, or need additional information please contact Christopher Koepke at (916) 227-1040.

Report by:



Christopher Koepke, C.E.G.
Engineering Geologist
Office of Geotechnical Design – North
Branch E

cc: Qiang Huang
R.E., Pending
Structures OE (E-copy)
D06 PCE – Peggy Lim
D06 DME – Ron Sekhon
GDN File
GS File Room

Memorandum

*Flex your power!
Be energy efficient!*

To: FRITZ HOFFMAN
Bridge Design Branch 06
Office of Bridge Design – Central
Division of Engineering Services

Date: March 17, 2009
File: 06-TUL-99-44.80
EA: 06-324501
Cross Creek Bridge
46-0032L
(widen)

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Foundation Recommendations

Introduction

Per your request, we are providing foundation recommendations for the culvert widening project referenced above. This culvert is part of the Goshen to Kingsburg widening project. This report is for use by the project design engineer, construction personnel, bidders and contractors.

Pertinent Plans and Data

The following resources were used in the assessment of the site conditions for these recommendations:

1. The general and foundation plans for the proposed culvert widening.
2. As-built exploratory borings (LOTB) for the original bridge structure done in 1970.
3. Regional groundwater level data, Well No. 16S22E21R001M (2008) and Well No. 16S22E16A001M (1995), Department of Water Resources (DWR), California.
4. Caltrans Seismic Hazard Map 1996.

Site Geology

The subsurface formations in the project area are alluvium and flood plain deposits. These materials consist of primarily granular interbedded sands, silts, clayey silts, silty sands and minor amounts of clay. These deposits vary in consistency from medium dense to dense.

Groundwater

Groundwater was encountered in the exploratory borings done in 1970 for the original bridge at an elevation of approximately 250 feet. More recent data from DWR records indicate that groundwater was measured at a depth of 32 feet below the existing ground surface in the project area. Groundwater is not expected to be a factor during construction if deep foundations are not utilized.

Seismicity

Based on the 1996 Caltrans Seismic Hazard Map, the controlling fault for the project alignment is the Coast Ranges-Sierran Block Boundary Zone Fault (reverse). This fault possesses a Maximum Credible Earthquake magnitude of $M_w = 7.0$, and is located approximately 47 miles from the project site to the west. Based on the referenced map, the peak bedrock acceleration for the new bridge is estimated to be 0.2g. The soil profile is classified as type "D" per the Department's Seismic Design Criteria (SDC).

Liquefaction Potential

The subsurface materials are medium dense to dense. Liquefaction potential is considered to be insignificant.

Surface Fault Rupture Hazard

Surface fault rupture is defined as displacement that occurs along the surface trace of a fault. The site is not located within any Earthquake Fault Zone (EFZ) as defined by the California Department of Conservation (Special Publication 42, 1997). There are no known faults crossing beneath or extending directly toward the site. Therefore, the potential hazard due to ground rupture is considered to be very low.

Corrosivity

Due to the granular nature of the subsurface soils the foundation materials should be considered to be non-corrosive to construction materials or structural elements.

Scour

The bridge site will not be subjected to scour.

Geotechnical Recommendations

Geotechnical Recommendations

The optimum foundation type from a geotechnical perspective is spread footings.

The proposed widening should be supported on spread footings sized using a maximum allowable bearing pressure of 3.0 ksf. The spread footings should be at least 2 feet wide and embedded at least 3 feet below existing ground surface or finished grade, whichever is deeper.

Table 1 lists the spread footing data to be incorporated into the contract plans.

Table 1. Spread Footing Data Table

Support Location	Allowable Bearing Capacity (ksf)	Nominal Bearing Capacity (ksf)
ALL	3.0	6.0

Construction Considerations

All spread footing excavations are to be inspected and approved by the Engineer prior to the placement of reinforcing steel.

If any conceptual changes are proposed during final project design, the Office of Geotechnical Design-North should review those changes to determine if the recommendations contained herein are still applicable.

Project Information

Standard Special Provision S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plans are:

- 1) As-Built Log of Test Borings (1970).
- 2) This report.

Data and information included in the Information Handout provided to the bidders and contractors are:

None.

Data and information available for inspection at the District Office:

None.

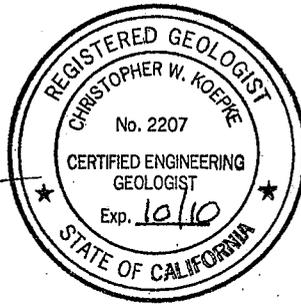
Data and information available for inspection at the Transportation Laboratory are:

None.

If you have any questions or comments, or need additional information please contact Christopher Koepke at (916) 227-1040.

Report by:

Chris Koepke



Christopher Koepke, C.E.G.
Engineering Geologist
Office of Geotechnical Design – North
Branch E

cc: Qiang Huang
R.E., Pending
Structures OE (E-copy)
D06 PCE – Peggy Lim
D06 DME – Ron Sekhon
GDN File
GS File Room

Memorandum

*Flex your power!
Be energy efficient!*

To: FRITZ HOFFMAN
Bridge Design Branch 06
Office of Bridge Design – Central
Division of Engineering Services

Date: February 17, 2009
File: 06-TUL-99-44.76
EA: 06-324501
Cross Creek Bridge
46-0031 (R/L)
(widen)

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Foundation Recommendations

Introduction

Per your request, we are providing foundation recommendations for the culvert widening project referenced above. This culvert is part of the Goshen to Kingsburg widening project. This report is for use by the project design engineer, construction personnel, bidders and contractors.

Pertinent Plans and Data

The following resources were used in the assessment of the site conditions for these recommendations:

1. The general and foundation plans for the proposed culvert widening.
2. As-built exploratory borings (LOTB) for the original bridge structure done in 1970.
3. Regional groundwater level data, Well No. 16S22E21R001M (2008) and Well No. 16S22E16A001M (1995), Department of Water Resources (DWR), California.
4. Caltrans Seismic Hazard Map 1996.

Site Geology

The subsurface formations in the project area are alluvium and flood plain deposits. These materials consist of primarily granular interbedded sands, silts, clayey silts, silty sands and minor amounts of clay. These deposits vary in consistency from medium dense to dense.

Groundwater

Groundwater was not encountered in the exploratory borings done in 1970 for the original bridge. More recent data from DWR records indicate that groundwater was measured at a depth of 32 feet below the existing ground surface in the project area. Groundwater is not expected to be a factor during construction if deep foundations are not utilized.

Seismicity

Based on the 1996 Caltrans Seismic Hazard Map, the controlling fault for the project alignment is the Coast Ranges-Sierran Block Boundary Zone Fault (reverse). This fault possesses a Maximum Credible Earthquake magnitude of $M_w = 7.0$, and is located approximately 47 miles from the project site to the west. Based on the referenced map, the peak bedrock acceleration for the new bridge is estimated to be 0.2g. The soil profile is classified as type "D" per the Department's Seismic Design Criteria (SDC).

Liquefaction Potential

The site is not located in an area shown as potentially liquefiable on the State Seismic Hazard Map. The subsurface materials are medium dense to dense. Liquefaction potential is considered to be low.

Surface Fault Rupture Hazard

Surface fault rupture is defined as displacement that occurs along the surface trace of a fault. The site is not located within any Earthquake Fault Zone (EFZ) as defined by the California Department of Conservation (Special Publication 42, 1997). There are no known faults crossing beneath or extending directly toward the site. Therefore, the potential hazard due to ground rupture is considered to be very low.

Corrosivity

Due to the granular nature of the subsurface soils the foundation materials should be considered to be non-corrosive to construction materials or structural elements.

Scour

The bridge site will not be subjected to scour.

Geotechnical Recommendations

The optimum foundation type from a geotechnical perspective is spread footings.

The proposed widening should be supported on spread footings sized using a maximum allowable bearing pressure of 3.0 ksf. The spread footings should be at least 2 feet wide and embedded at least 3 feet below existing ground surface or finished grade, whichever is deeper.

Table 1 lists the spread footing data to be incorporated into the contract plans.

Table 1. Spread Footing Data Table

Support Location	Allowable Bearing Capacity (ksf)	Nominal Bearing Capacity (ksf)
ALL	3.0	6.0

Construction Considerations

All spread footing excavations are to be inspected and approved by the Engineer prior to the placement of reinforcing steel.

If any conceptual changes are proposed during final project design, the Office of Geotechnical Design-North should review those changes to determine if the recommendations contained herein are still applicable.

Project Information

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Data and information attached with the project plans are:

- 1) As-Built Log of Test Borings (1970).
- 2) This report.

Data and information included in the Information Handout provided to the bidders and contractors are:

None.

Data and information available for inspection at the District Office:

None.

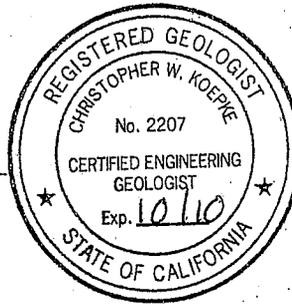
Data and information available for inspection at the Transportation Laboratory are:

None.

If you have any questions or comments, or need additional information please contact Christopher Koepke at (916) 227-1040.

Report by:

Chris Koepke



Christopher Koepke, C.E.G.
Engineering Geologist
Office of Geotechnical Design – North
Branch E

cc: Qiang Huang
R.E., Pending
Structures OE (E-copy)
D06 PCE – Peggy Lim
D06 DME – Ron Sekhon
GDN File
GS File Room

Memorandum

*Flex your power!
Be energy efficient!*

To: FRITZ HOFFMAN
Bridge Design Branch 06
Office of Bridge Design – Central
Division of Engineering Services

Date: February 17, 2009
File: 06-TUL-99-44.62
EA: 06-324501
Cross Creek Bridge
46-0030 (R/L)
(widen)

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Foundation Recommendations

Introduction

Per your request, we are providing foundation recommendations for the culvert widening project referenced above. This culvert is part of the Goshen to Kingsburg widening project. This report is for use by the project design engineer, construction personnel, bidders and contractors.

Pertinent Plans and Data

The following resources were used in the assessment of the site conditions for these recommendations:

1. The general and foundation plans for the proposed culvert widening.
2. As-built exploratory borings (LOTB) for the original bridge structure done in 1970.
3. Regional groundwater level data, Well No. 16S22E21R001M (2008) and Well No. 16S22E16A001M (1995), Department of Water Resources (DWR), California.
4. Caltrans Seismic Hazard Map 1996.

Site Geology

The subsurface formations in the project area are alluvium and flood plain deposits. These materials consist of primarily granular interbedded sands, silts, clayey silts, silty sands and minor amounts of clay. These deposits vary in consistency from medium dense to dense.

Groundwater

Groundwater was encountered in the exploratory borings done in 1970 for the original bridge at an elevation of approximately 255 feet. More recent data from DWR records indicate that groundwater was measured at a depth of 32 feet below the existing ground surface in the project area. Groundwater is not expected to be a factor during construction if deep foundations are not utilized.

Seismicity

Based on the 1996 Caltrans Seismic Hazard Map, the controlling fault for the project alignment is the Coast Ranges-Sierran Block Boundary Zone Fault (reverse). This fault possesses a Maximum Credible Earthquake magnitude of $M_w = 7.0$, and is located approximately 47 miles from the project site to the west. Based on the referenced map, the peak bedrock acceleration for the new bridge is estimated to be 0.2g. The soil profile is classified as type "D" per the Department's Seismic Design Criteria (SDC).

Liquefaction Potential

The site is not located in an area shown as potentially liquefiable on the State Seismic Hazard Map. The subsurface materials are medium dense to dense. Liquefaction potential is considered to be low.

Surface Fault Rupture Hazard

Surface fault rupture is defined as displacement that occurs along the surface trace of a fault. The site is not located within any Earthquake Fault Zone (EFZ) as defined by the California Department of Conservation (Special Publication 42, 1997). There are no known faults crossing beneath or extending directly toward the site. Therefore, the potential hazard due to ground rupture is considered to be very low.

Corrosivity

Due to the granular nature of the subsurface soils the foundation materials should be considered to be non-corrosive to construction materials or structural elements.

Scour

The bridge site will not be subjected to scour.

Geotechnical Recommendations

The optimum foundation type from a geotechnical perspective is spread footings.

The proposed widening should be supported on spread footings sized using a maximum allowable bearing pressure of 3.0 ksf. The spread footings should be at least 2 feet wide and embedded at least 3 feet below existing ground surface or finished grade, whichever is deeper.

Table 1 lists the spread footing data to be incorporated into the contract plans.

Table 1. Spread Footing Data Table

Support Location	Allowable Bearing Capacity (ksf)	Nominal Bearing Capacity (ksf)
ALL	3.0	6.0

Construction Considerations

All spread footing excavations are to be inspected and approved by the Engineer prior to the placement of reinforcing steel.

If any conceptual changes are proposed during final project design, the Office of Geotechnical Design-North should review those changes to determine if the recommendations contained herein are still applicable.

Project Information

Standard Special Provision S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plans are:

- 1) As-Built Log of Test Borings (1970).
- 2) This report.

Data and information included in the Information Handout provided to the bidders and contractors are:

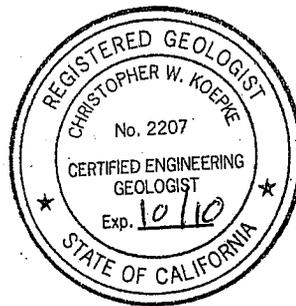
None.

*Data and information available for inspection at the District Office:
None.*

*Data and information available for inspection at the Transportation Laboratory are:
None.*

If you have any questions or comments, or need additional information please contact Christopher Koepke at (916) 227-1040.

Report by:



Christopher Koepke, C.E.G.
Engineering Geologist
Office of Geotechnical Design – North
Branch E

cc: Qiang Huang
R.E., Pending
Structures OE (E-copy)
D06 PCE – Peggy Lim
D06 DME – Ron Sekhon
GDN File
GS File Room

Memorandum

*Flex your power!
Be energy efficient!*

To: FRITZ HOFFMAN
Bridge Design Branch 06
Office of Bridge Design – Central
Division of Engineering Services

Date: February 17, 2009
File: 06-FRE-99-0.94
EA: 06-324501
Conejo Ave. Separation
42-0225 (R/L)
(widen)

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Foundation Recommendations

Introduction

Per your request, we are providing foundation recommendations for the bridge widening project referenced above. This bridge is part of the Goshen to Kingsburg widening project. This report is for use by the project design engineer, construction personnel, bidders and contractors.

Pertinent Plans and Data

The following resources were used in the assessment of the site conditions for these recommendations:

1. The general and foundation plans for the proposed bridge widening.
2. As-built exploratory borings (LOTB) for the original bridge structure done in 1961.
3. Regional groundwater level data, Well No. 16S22E21R001M (2008) and Well No. 16S22E16A001M (1995), Department of Water Resources (DWR), California.
4. Caltrans Seismic Hazard Map 1996.

Site Geology

The subsurface formations in the project area are alluvium and flood plain deposits. These materials consist of primarily granular interbedded sands, silts, clayey silts, silty sands and minor amounts of clay. These deposits vary in consistency from loose to very dense.

Groundwater

Groundwater was encountered in all of the exploratory borings done in 1961 for the original bridge. More recent data from DWR records indicate that groundwater was measured at a depth of 32 feet below the existing ground surface in the project area and may be a factor during construction of CIDH pile foundations. Groundwater elevations are subject to seasonal fluctuations and depend on local conditions at the time of construction.

Seismicity

Based on the 1996 Caltrans Seismic Hazard Map, the controlling fault for the project alignment is the Coast Ranges-Sierran Block Boundary Zone Fault (reverse). This fault possesses a Maximum Credible Earthquake magnitude of $M_w = 7.0$, and is located approximately 47 miles from the project site to the west. Based on the referenced map, the peak bedrock acceleration for the new bridge is estimated to be 0.2g. The soil profile is classified as type "D" per the Department's Seismic Design Criteria (SDC).

Liquefaction Potential

The site is not located in an area shown as potentially liquefiable on the State Seismic Hazard Map. Liquefaction potential is considered to be low per the analysis done by the Structure Foundation Branch of this Office, April 5, 1999.

Surface Fault Rupture Hazard

Surface fault rupture is defined as displacement that occurs along the surface trace of a fault. The site is not located within any Earthquake Fault Zone (EFZ) as defined by the California Department of Conservation (Special Publication 42, 1997). There are no known faults crossing beneath or extending directly toward the site. Therefore, the potential hazard due to ground rupture is considered to be very low.

Corrosivity

Due to the granular nature of the subsurface soils the foundation materials should be considered to be non-corrosive to construction materials or structural elements.

Scour

The bridge site will not be subjected to scour.

Geotechnical Recommendations

Based on the previous foundation investigations, review of the general and foundation plans and structural engineering requirements, 24 inch diameter Cast-In-Drilled-Hole (CIDH) piles are the optimum foundation type for all support locations. Tables 1 and 2 list the foundation recommendation parameters. Table 3 is the pile data table to be included in the project contract documents.

Table 1. Foundation Recommendations for Abutments
 24 inch diameter CIDH

Abutment Foundation Design Recommendations									
Support Location	Pile Type	Cut-off Elevation (ft)	LRFD Service-I Limit State Load Per Support (kips)		LRFD Service-I Limit State Total Load Per Pile (kips)	Nominal Resistance (kips)	Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
			Total	Permanent	Compression				
Abut 1	24 inch Ø CIDH	309.2	1071	576	81	170	258.0 (a)	258.0	N/A
Abut 4	24 inch Ø CIDH	309.5	1071	576	81	170	258.0 (a)	258.0	N/A

Notes: 1) Design tip elevations are controlled by (a) compression.

Table 2. Foundation Recommendations for Piers/Bents
 24 inch diameter CIDH

Bent Foundation Design Recommendations											
Support Location	Pile Type	Cut-off Elevation (ft)	Service Limit State I Load (kips)	Total Permissible Support Settlement (inches)	Required Factored Nominal Resistance (kips)				Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
					Strength Limit		Extreme Event				
					Comp. $\phi=0.7$	Tension $\phi=0.7$	Comp. $\phi=1.0$	Tension $\phi=1.0$			
Pier 2	24 inch Ø CIDH	294.9	4215	1	175	0	95	0	248.0 (a)	248.0	N/A
Pier 3	24 inch Ø CIDH	294.9	4215	1	175	0	95	0	248.0 (a)	248.0	N/A

Notes: 1) Design tip elevations are controlled by (a) compression.

Table 3. Pile Data Table

Support Location	Pile Type (ft)	Nominal Resistance (kips)		Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
		Compression	Tension			
Abut 1	24 inch Ø CIDH	170	N/A	258.0 (a)	258.0	N/A
Pier 2	24 inch Ø CIDH	250	0	248.0 (a)	248.0	N/A
Pier 3	24 inch Ø CIDH	250	0	248.0 (a)	248.0	N/A
Abut 4	24 inch Ø CIDH	170	N/A	258.0 (a)	258.0	N/A

Notes: 1) Design tip elevations are controlled by (a) compression.

Construction Considerations

The calculated geotechnical capacity of the CIDH piles is based on skin friction only.

Groundwater is present in recent water well data and may be encountered during construction of the CIDH piles. Simple dewatering of the CIDH excavations by pumping methods prior to the placement of concrete is to be considered feasible if groundwater is encountered.

If any conceptual changes are proposed during final project design, the Office of Geotechnical Design-North should review those changes to determine if the recommendations contained herein are still applicable.

Project Information

Standard Special Provision S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plans are:

- 1) As-Built Log of Test Borings (1961).
- 2) This report.

Data and information included in the Information Handout provided to the bidders and contractors are:

None.

Data and information available for inspection at the District Office:

None.

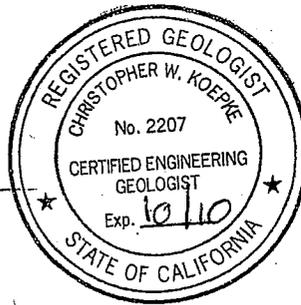
Data and information available for inspection at the Transportation Laboratory are:

None.

If you have any questions or comments, or need additional information please contact Christopher Koepke at (916) 227-1040.

Report by:

Chris Koepke



Christopher Koepke, C.E.G.
Engineering Geologist
Office of Geotechnical Design – North
Branch E

cc: Qiang Huang
R.E., Pending
Structures OE (E-copy)
D06 PCE – Peggy Lim
D06 DME – Ron Sekhon
GDN File
GS File Room

Memorandum

*Flex your power!
Be energy efficient!*

To: FRITZ HOFFMAN
Bridge Design Branch 06
Office of Bridge Design – Central
Division of Engineering Services

Date: February 17, 2009
File: 06-TUL-99-49.20
EA: 06-324501
Traver Canal Bridge
46-0035 (R/L)
(replace)

From: **DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5**

Subject: Foundation Recommendations

Introduction

Per your request, we are providing foundation recommendations for the culvert replacement project referenced above. This culvert is part of the Goshen to Kingsburg widening project. This report is for use by the project design engineer, construction personnel, bidders and contractors.

Pertinent Plans and Data

The following resources were used in the assessment of the site conditions for these recommendations:

1. The general and foundation plans for the proposed culvert replacement.
2. As-built exploratory borings (LOTB) for the original bridge structure done in 1956.
3. Regional groundwater level data, Well No. 16S22E21R001M (2008) and Well No. 16S22E16A001M (1995), Department of Water Resources (DWR), California.
4. Caltrans Seismic Hazard Map 1996.

Site Geology

The subsurface formations in the project area are alluvium and flood plain deposits. These materials consist of primarily granular interbedded sands, silts, clayey silts, silty sands and minor amounts of clay. These deposits vary in consistency from loose to dense.

Groundwater

Groundwater was encountered in the exploratory borings done in 1970 for the original bridge at an elevation of approximately 275 feet. More recent data from DWR records indicate that groundwater was measured at a depth of 32 feet below the existing ground surface in the project area. Groundwater is not expected to be a factor during construction if deep foundations are not utilized.

Seismicity

Based on the 1996 Caltrans Seismic Hazard Map, the controlling fault for the project alignment is the Coast Ranges-Sierran Block Boundary Zone Fault (reverse). This fault possesses a Maximum Credible Earthquake magnitude of $M_w = 7.0$, and is located approximately 47 miles from the project site to the west. Based on the referenced map, the peak bedrock acceleration for the new bridge is estimated to be 0.2g. The soil profile is classified as type "D" per the Department's Seismic Design Criteria (SDC).

Liquefaction Potential

The site is not located in an area shown as potentially liquefiable on the State Seismic Hazard Map. The subsurface materials are medium dense to dense. Liquefaction potential is considered to be low.

Surface Fault Rupture Hazard

Surface fault rupture is defined as displacement that occurs along the surface trace of a fault. The site is not located within any Earthquake Fault Zone (EFZ) as defined by the California Department of Conservation (Special Publication 42, 1997). There are no known faults crossing beneath or extending directly toward the site. Therefore, the potential hazard due to ground rupture is considered to be very low.

Corrosivity

Due to the granular nature of the subsurface soils the foundation materials should be considered to be non-corrosive to construction materials or structural elements.

Scour

The bridge site will not be subjected to scour.

Geotechnical Recommendations

The optimum foundation type from a geotechnical perspective is spread footings.

The proposed replacement should be supported on spread footings sized using a maximum allowable bearing pressure of 2.0 ksf. The spread footings should be at least 2 feet wide and embedded at least 3 feet below existing ground surface or finished grade, whichever is deeper.

Table 1 lists the spread footing data to be incorporated into the contract plans.

Table 1. Spread Footing Data Table

Support Location	Allowable Bearing Capacity (ksf)	Nominal Bearing Capacity (ksf)
ALL	2.0	4.0

Construction Considerations

All spread footing excavations are to be inspected and approved by the Engineer prior to the placement of reinforcing steel.

If any conceptual changes are proposed during final project design, the Office of Geotechnical Design-North should review those changes to determine if the recommendations contained herein are still applicable.

Project Information

Standard Special Provision S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plans are:

- 1) As-Built Log of Test Borings (1956).
- 2) This report.

Data and information included in the Information Handout provided to the bidders and contractors are:

None.

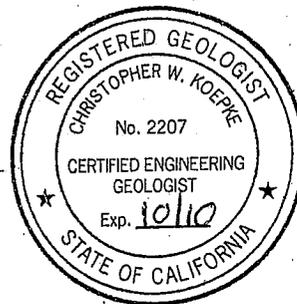
Data and information available for inspection at the District Office:
None.

Data and information available for inspection at the Transportation Laboratory are:
None.

If you have any questions or comments, or need additional information please contact Christopher Koepke at (916) 227-1040.

Report by:

Chris Koepke



Christopher Koepke, C.E.G.
Engineering Geologist
Office of Geotechnical Design – North
Branch E

cc: Qiang Huang
R.E., Pending
Structures OE (E-copy)
D06 PCE – Peggy Lim
D06 DME – Ron Sekhon
GDN File
GS File Room

DIVISION OF STRUCTURES Final Hydraulic Report

Cross Creek, Traver Canal, Kings River

Located in Tulare and Fresno County

JOB:

Bridge No. 45-0030,0031,0032,0033-0034 L/R, 46-0035 L/R, 46-0036 L/R

LOCATION:

06-Tul/Fre-Rte 99-PM 41.3/1.0

DATE:

June 17, 2008

WRITTEN BY:

Neal Alie

REVIEWED BY:

Steve Ng

Memorandum

To: Fritz Hoffman
Office of Bridge Design
Design Branch 6

Date: June 17, 2008

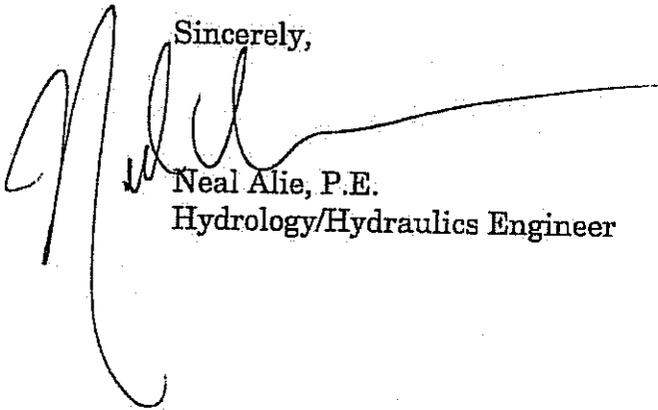
File:06-Tul/Fre-99, PM 41.3/1.0
EA 06-324501
State Route 99 Widening

From: Department of Transportation
Hydraulic Engineering Branch

Subject: Final Hydraulic Report for the

Attached for your records is the Final Hydraulic Report for the
above referenced project. If you have any questions, please contact me
at 227-0442.

Sincerely,



Neal Alie, P.E.
Hydrology/Hydraulics Engineer

cc: Steve Ng

Cross Creek Bridges
Traver Canal Bridge
Kings River Bridge
Bridge No. 45-0030-0034 L/R, 46-0035 L/R, 46-0036 L/R
06-Tul/Fre-Rte 99-PM 41.3/1.0
EA 06-324501

General

District 6 is proposing to widen State Route 99 in Tulare and Fresno County from 0.2 mile north of north Goshen Overhead to 0.1 mile north of Conejo Av. Under crossing. The project proposes to convert the existing four-and five-lane freeway to a six-lane freeway and widen all shoulders to 10.0 ft.

The project will involve widening the five Cross Creek Bridges, Br. No. 46-0030L/R, 46-0031L/R, 46-0032L/R, and 46-0033L/R and 46-0034L/R, widening Traver Canal Bridge, Br. No. 46-0035 L/R and widening Kings River Bridge, Br. No. 46-0036R and replacing Kings River Bridge, Br. No. 46-0036L.

This report makes extensive reference to data and analysis found in the following: (1) General plans and profiles submitted by the Office of Structure Design, (2) Bridge Maintenance Reports for existing structures, (3) As-Built Plans for existing structures, (4) FEMA Study, October 6, 1998, (5) Division of Structures Preliminary Reports, 1993. (6) Previous Structure Hydraulic Studies, March 29, 1999, (7) Private Consultant Report by R.L.Schafer, August 1995.

All elevations indicated in this report are referenced to the (Datum provided by Structure Design) Dated February 2000.

Drainage Basin

Cross Creek

Approximately 1.8 miles upstream from the proposed site, the St Johns River and Cottonwood Creek combine to form the Cross Creek channels. From that point Cross Creek flows southwest for approximately 35.0 miles to the Tulare Lake Basin. The main and largest Cross Creek channel flows through Br. No. 46-0032 L/R but when this channel overflows four other branches of Cross Creek form flowing towards State Route 99 through the other RCB Culvert Bridges.

The St Johns River is one of the two main channels of the Kaweah River Delta and begins at McKay Point on the Kaweah River. Approximately half of the flow of the Kaweah River is diverted into the St Johns River and flows westerly approximately 23 miles to Cross Creek. Cottonwood Creek starts at elevation 3500 ft near badger and flows south to Woodlake then west into a marshy area approximately one mile south of Seville, then west to Elbow Creek and the St Johns River.

Cross Creek Bridges
Traver Canal Bridge
Kings River Bridge
Bridge No. 45-0030-0034 L/R, 46-0035 L/R, 46-0036 L/R
06-Tul/Fre-Rte 99-PM 41.3/1.0
EA 06-324501

The drainage basin of Cross Creek therefore is the area between Kings River Basin on the north and Mill Creek on the south and with the exception of the Kaweah River basin is generally rolling rangeland. The area approximately 6 to 8 mi above the bridge site is a wide flat valley sloping about 8 ft per mile. In this valley Cross Creek and the various streams tributary to Cross Creek are meandering with interconnected channels with overflow occurring all through the valley. Thus there is considerable channel and valley storage of flood flows. Annual precipitation west of the foothills ranges from 10 to 16 inches.

Kings River

The Kings River drains a portion of the western slope of the Southern Sierra Nevada plus a portion of the San Joaquin Valley. The basin is bounded by the San Joaquin River and Dry Creek on the north, by the Kaweah and Kern Rivers on the south, and by the crest of the Sierra Nevada on the east. The watershed area above State Route 99 is approximately 2000 square miles.

In 1954 the Pine Flat Dam near the town of Piedra was constructed and the Kings River flows began to be restricted. The Corps of Engineers operated the dam and reservoir with a storage capacity of 1,000,000 acre-feet below elevation 951.5 feet and a spillway flood pool capacity of 1,110,800 acre-feet below elevation 969.3 feet. The flood discharges were controlled so that the channel capacity downstream of the dam was not exceeded.

The tributary area above Pine Flat Dam consists of 1545 square miles and ranges up to the rocky peaks at elevation 14,000 feet. The basin supports a moderate to dense cover of native growth below timberline, about elevation 10,000 feet. Land use is primarily dry-land agricultural, timber production and recreational.

The only major contributor to Kings River below Pine Flat Dam is Mill Creek with a drainage basin of approximately 130 square miles. The remaining valley area below Piedra is extensively agricultural with moderate residential-commercial development. Annual precipitation west of the foothills ranges from 10 to 16 inches.

Traver Canal

Traver Canal is part of the Alta Irrigation District and is a man-made irrigation ditch built years ago with no as-builts or any information available. Although mainly controlled flow there is a small watershed area and several small drainage canals that contribute to the total discharge.

Discharge

Cross Creek

Discharge Information was obtained from a hydraulic Report completed in August 1995 by a private Engineering Firm, (R.L. Schafer & Associates), 1-559-734-1348 hired by the Kaweah Irrigation District.

Approximately 1.8 mi upstream of State Route 99 at the confluence of Cottonwood Creek and St Johns River, which is the beginning of Cross Creek the 100-year discharge in the channel and overland is approximately 18,900 cfs. From this point, Cross Creek flows southwesterly and branches out into several channels flowing towards State route 99. As flows exceed the several channels capacity of 3500 cfs the discharge commences spreading overland.

Flows exceeding 5000 cfs will most likely flood the frontage road, which is further downstream. Flows between 9000 and 10,000cfs will most likely flood the SR 99 Southbound lanes. The SPRR upstream of State Route 99 has a maximum capacity of 12,000 cfs, which would flood SR 99 and the downstream frontage road.

Because of the large storage above the site it is not possible to determine peak flows at the site from any of the standard rainfall-run-off formulas. The interconnection of the various meandering channels of Cross Creek above and below the site make the determination of flow through the various bridges practically impossible by the slope area method. It appears the maximum capacity of the Cross Creek channels is approximately 9000 cfs at State Route 99.

The maximum capacity of each bridge is what will be used for the design discharge for this project for each Cross Creek Bridge and is given below for submerged conditions:

Bridge No.	Maximum Capacity
46-0030 L/R	1540 cfs
46-0031 L/R	1980 cfs
46-0032 L/R	3880 cfs
46-0033 L/R	1440 cfs
46-0034 L/R	680 cfs

Cross Creek Bridges
Traver Canal Bridge
Kings River Bridge
Bridge No. 45-0030-0034 L/R, 46-0035 L/R, 46-0036 L/R
06-Tul/Fre-Rte 99-PM 41.3/1.0
EA 06-324501

During major storm events it has been noted that highway 99 has flooded and water has accumulated upstream of the SPRR forming several feet of water.

Kings River

Pine Flat Lake is operated to provide a maximum practical amount of storage space for irrigation water and to restrict flows in the downstream channels of the Kings River to non-damaging flow rates and to minimize flood flows into the Tulare Lakebed without causing flood damage along the San Joaquin River. The unregulated 100-year discharge at the Pine Flat Dam is approximately **155,000 cfs**. According to the Sacramento Office of the Corps of Engineers the maximum discharge from Pine Flat Lake is approximately **17,000 cfs** and the discharge at State Route 99 is between **11,000 to 12,000 cfs**, which is slightly below the estimated 100-year channel capacity of **13,000 cfs** at State Route 99. Mr. Steve Haugen with the Kings River Water Association at 1-(559)-266-0767 also confirmed that the 100-year discharge at the project site was **13,000 cfs**. The 50-year discharge was estimated to be approximately **10,000 cfs**.

Traver Canal

Traver Canal is controlled by the Alta Irrigation District and according to the Engineer Mr. Jim Wegley at 1-(559) 732-7938 the irrigation demand is approximately **80 cfs** at this location and the rest of the flow is due to storm water and several drainage ditches draining into Traver Canal. According to Mr. Wegley the canal has been overtopped on several occasions. Using the Manning's Equation the maximum capacity of Traver Canal for the right bridge was calculated to be a total of **311.0 cfs**. It appears that the left bridge, which is a two cell 9.8 x 5.9 ft RCB Culvert, has less discharge capacity and was calculated to be approximately **183 cfs**.

Stage, Velocity and Waterway

Cross Creek

It appears that the entire Cross Creek system of culverts under SR 99 is hydraulically undersized for both a 50-year and a 100-year event. The table below shows the maximum capacity each bridge can handle and the maximum associated water surface elevation and velocity.

Cross Creek Bridges
 Traver Canal Bridge
 Kings River Bridge
 Bridge No. 45-0030-0034 L/R, 46-0035 L/R, 46-0036 L/R
 06-Tul/Fre-Rte 99-PM 41.3/1.0
 EA 06-324501

Cross Creek Bridge No.	Waterway Openings	Maximum Capacity	Minimum Soffit Elevation	Velocity	Max Water Surface Elevation
46-0030 L/R	384 sqft	1540 cfs	270.9 ft	4.0 fps	270.0 ft
46-0031 L/R	494 sqft	1980 cfs	272.8 ft	4.0 fps	272.0 ft
46-0032 L/R	970 sqft	3880 cfs	272.4 ft	4.0 fps	272.0 ft
46-0033 L/R	360 sqft	1440 cfs	273.9 ft	4.0 fps	273.0 ft
46-0034 L/R	169 sqft	680 cfs	271.4 ft	4.0 fps	271.0 ft

The Cross Creek system of culverts under State Route 99 reveals a hydraulically undersized conveyance system even for a flood event less than a 50-year flow.

Structure Hydraulics recommends that all waterway areas should be equal to or greater than the existing waterway areas. The existing minimum soffit elevation should not be reduced and should at least be kept the same for all Cross Creek Structures.

Kings River

The Hydraulic Program (BrEase) was used to perform a one-dimensional hydraulic analysis to calculate the water surface elevation (WSEL) and velocity for the existing structure that will remain and for the proposed new structures at Kings River. The average velocity and the stage for the 50-year and 100-year discharges at the upstream face of the bridge are given below. The results are based on a roughness coefficient of 0.035 and a gradient of 0.0007.

50-Year Discharge	10,000 cfs
Velocity (50-year)	3.6 fps
WSEL (50-Year)	284.2 ft
Minimum Soffit Elevation for Rt Bridge	293.7 ft
Available Freeboard (50-Year)	9.5 ft
100-year Discharge	13,000 cfs
Velocity (100-year)	4.0 fps
WSEL (100-Year)	285.2 ft
Available Freeboard (100-Year)	8.5 ft

Cross Creek Bridges
Traver Canal Bridge
Kings River Bridge
Bridge No. 45-0030-0034 L/R, 46-0035 L/R, 46-0036 L/R
06-Tul/Fre-Rte 99-PM 41.3/1.0
EA 06-324501

It appears that there is more than adequate freeboard for both the existing right structure that is being widened and for the proposed left structure being replaced. Structure Hydraulics recommends maintaining the minimum soffit elevation for all new or widened structures.

Traver Canal

The right bridge is a 3 cell 14 ft by 5.2 ft RCB Culvert with a total waterway area of 218.4 sqft. Assuming the Canal will be flowing full the maximum water surface elevation is approximately 288.0 ft. The left bridge is a 2 cell 10 ft by 6 ft RCB Culvert with a total waterway area of 120.0 sqft, which is smaller than the upstream bridge. **There is a significant dissimilarity in bridge length that would require an abrupt transition at the joining of these structures. In addition the orientation of these structures, relative to each other, creates a mismatched alignment of the interior cell walls effectively reducing waterway capacity. This is not acceptable by Structure Hydraulics and Structure Design should facilitate an acceptable transition between the existing structures.**

Scour

The streambed consists of sandy silt with light growths of weeds and tule. The Bridge sites are located on alluvial deposits on the San Joaquin Valley Floor. Subsurface materials consist of sand, clay, and gravel.

Cross Creek

Br. No. 46-0030, 31, 33, 34 L/R

Both the right and left bridges are RCB Culverts and Structure Hydraulics does not have any scour concerns. Aggradation could be expected due to the bridge's being located in an alluvial fan.

In April 2000 an evaluation for scour potential was assessed in accordance with FHWA Technical Advisory T5140.23, "Evaluating Scour at Bridges", and within current Caltrans guidelines. The existing bridge was determined to be not scour critical. The NBIS Item 113 code was changed from 6 to 8, "Bridge Foundations determined to be stable for calculated scour conditions.

Br. No. 46-0032 L/R

The left bridge is a RCB Culvert and Structure Hydraulics has no scour concerns.

According to the Caltrans Maintenance Records there has been no history of any scour problems for the right bridge. There has been a history of aggradation at this bridge site requiring the channel to be excavated to provide a more adequate waterway.

In April 2000 an evaluation for scour potential was assessed in accordance with FHWA Technical Advisory T5140.23, "Evaluating Scour at Bridges", and within current Caltrans guidelines. The existing bridge was determined to be not scour critical. The NBIS Item 113 code was changed from 6 to 8, "Bridge Foundations determined to be stable for calculated scour conditions.

The potential local pier scour was calculated to be 3.0 ft for Piers 2 through 5 at elevation 261.8 ft. Structure Hydraulics recommends that for all new foundations to be designed assuming no ground support (lateral or vertical) as a result of soil loss due to possible scour or lateral stream migration.

Kings River

According to the Caltrans Maintenance Records illegal mining operations have operated at this bridge site in the past and were still operating as recent as July 2004. Channel sections were compared to historical sections and there was no apparent degradation. Although the mining operation has stopped the effects may not be apparent until a future date. Structure Hydraulics recommends monitoring this structure especially during major storm events to see if there are any changes.

The scour potential was assessed in accordance with FHWA Technical Advisory T5140.23, "Evaluating Scour at Bridges", and within current Caltrans guidelines. The existing bridge was determined to be not scour critical. The NBIS Item 113 code was changed from 6 to 8, "Bridge Foundations determined to be stable for calculated scour conditions; calculated scour is above top of footing".

The potential local pier scour was calculated to be 4.8 ft for Piers 2 through 9 at elevation 267.4 ft. Structure Hydraulics recommends that all foundations be designed assuming no ground support (lateral or vertical) as a result of soil loss due to possible scour or lateral stream migration.

Cross Creek Bridges
Traver Canal Bridge
Kings River Bridge
Bridge No. 45-0030-0034 L/R, 46-0035 L/R, 46-0036 L/R
06-Tul/Fre-Rte 99-PM 41.3/1.0
EA 06-324501

Traver Canal

Traver Canal is a RCB Culvert and Structure Hydraulics does not have any scour concerns.

Drift

Cross Creek Bridges

There are some seasonal vegetation weeds in the channel but not enough to obstruct the flow.

Kings River

According to the Caltrans Maintenance Records the existing spans have passed most drift without difficulties. Some minor drift is retained by the pile bents but due to the low velocities no major problems have occurred.

Traver Canal

According to the Caltrans Maintenance Records, Traver Canal has experienced some minor drift and landscape debris.

Bank Protection

Cross Creek Bridges

The only structure that might be considered for bank protection would be Br. No. 46-0032R, and that would be a decision made by the district. Velocities have been provided on page 5.

Kings River

It appears that sacked concrete slope protection has been installed at the right structure at Abutment 1 and 10. If the district intends to extend the slope protection velocities has been provided on page 5.

Cross Creek Bridges
 Traver Canal Bridge
 Kings River Bridge
 Bridge No. 45-0030-0034 L/R, 46-0035 L/R, 46-0036 L/R
 06-Tul/Fre-Rte 99-PM 41.3/1.0
 EA 06-324501

Traver Canal

No bank protection is needed at this location.

Cross Creek Bridges

Br. No. 46-0030 L/R			
Drainage Area: N/A			
	Max Discharge Design Flood		
Frequency	Max Capacity		
Discharge	1540 cfs		
Water Surface Elevation at Bridge	270.0 ft		
Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.			

HYDROLOGIC SUMMARY Br. No. 46-0031 L/R			
Drainage Area: N/A			
	Max Discharge Design Flood		
Frequency	Max Capacity		
Discharge	1980 cfs		
Water Surface Elevation at Bridge	272.0 ft		

Cross Creek Bridges
 Traver Canal Bridge
 Kings River Bridge
 Bridge No. 45-0030-0034 L/R, 46-0035 L/R, 46-0036 L/R
 06-Tul/Fre-Rte 99-PM 41.3/1.0
 EA 06-324501

Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.

HYDROLOGIC SUMMARY Br. No. 46-0032 L/R			
Drainage Area: N/A			
	Max Discharge Design Flood		
Frequency	Max Capacity		
Discharge	3880 cfs		
Water Surface Elevation at Bridge	272.0 ft		
Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.			

HYDROLOGIC SUMMARY Br. No. 46-0033 L/R			
Drainage Area: N/A			
	Max Discharge Design Flood		
Frequency	Max Capacity		
Discharge	1440 cfs		
Water Surface Elevation at Bridge	273.0 ft		
Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.			

Memorandum

*Flex your power!
Be energy efficient!*

To: FRITZ HOFFMAN
Bridge Design Branch 06
Office of Bridge Design – Central
Division of Engineering Services

Date: March 10, 2009
File: 06-TUL-99-44.80
EA: 06-324501
Cross Creek Bridge
46-0032R
(widen)

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Nominal Capacity Evaluation of Existing Piles

We have reviewed the as-built data for the existing bridge structure in order to estimate the actual provided resistance of the existing pile foundation. Based on the General Plan it is intended to add concrete barriers to both sides of the existing bridge.

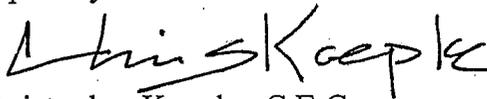
The existing piles consist of "Class I" and "Class II" driven concrete piles. Class I piles were used at Abutment 1 through Bent 5. Class II piles were installed for the support of Abutment 6. The specified tip elevation for all piles was 235 feet and all piles were predrilled to assist driving.

The assumed method used to verify the capacity of these piles at the time of installation was the E.N.R. (Engineering News Record) dynamic formula, which is widely known now to have been inaccurate and overly conservative with a theoretical safety factor of 3.

Based on these facts the estimated actual nominal capacity of the piles to be used to support the widening should be considered to be at least 1.5 times the original calculated acceptance value, or 135 tons.

If you have any questions or comments, or need additional information please contact Christopher Koepke at (916) 227-1040.

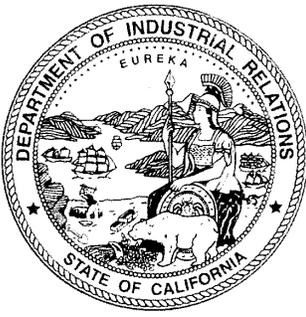
Report by:



Christopher Koepke, C.E.G.
Engineering Geologist
Office of Geotechnical Design – North
Branch E



cc: GDN File, GS File Room



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C008-107-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2015 E Shields, Suite 100, Fresno, California 93726
(MAILING ADDRESS)

at ROUTE 99 IMPROVEMENTS – TULARE COUNTY (DS 29)
(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 30-inch diameter by 75 feet long tunnel project located under Route 99, approximately 0.5 miles south of the intersection of Route 99 and Merritt Drive Overcrossing, Traver, Tulare County.

This classification shall be conspicuously posted at the place of employment.

Date July 21, 2009

John R. Leahy
(SENIOR ENGINEER)
John R. Leahy



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C009-107-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2015 E Shields, Suite 100, Fresno, California 93726
(MAILING ADDRESS)

at ROUTE 99 IMPROVEMENTS – TULARE COUNTY (DS 30)
(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 30-inch diameter by 81 feet long tunnel project located under Route 99, approximately 0.1 miles south of the intersection of Route 99 and Merritt Drive Overcrossing, Traver, Tulare County.

This classification shall be conspicuously posted at the place of employment.

July 21, 2009

Date John R. Leahy
(SENIOR ENGINEER)
John R. Leahy



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C010-107-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2015 E Shields, Suite 100, Fresno, California 93726
(MAILING ADDRESS)

at ROUTE 99 IMPROVEMENTS – TULARE COUNTY (DS 31)
(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 30-inch diameter by 105 feet long tunnel project located under Route 99, approximately 200 feet north of the intersection of Route 99 and Merritt Drive Overcrossing, Traver, Tulare County.

This classification shall be conspicuously posted at the place of employment.

July 21, 2009

Date

John R. Leahy
(SENIOR ENGINEER)
John R. Leahy



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C011-107-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2015 E Shields, Suite 100, Fresno, California 93726
(MAILING ADDRESS)

at ROUTE 99 IMPROVEMENTS – TULARE COUNTY (DS 34)
(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 30-inch diameter by 90 feet long tunnel project located under Route 99, approximately 600 feet north of the intersection of Route 99 and Merritt Drive Overcrossing, Traver, Tulare County.

This classification shall be conspicuously posted at the place of employment.

July 21, 2009

Date John R. Leahy
(SENIOR ENGINEER)
John R. Leahy



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C012-107-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2015 E Shields, Suite 100, Fresno, California 93726
(MAILING ADDRESS)

at ROUTE 99 IMPROVEMENTS – TULARE COUNTY (DS 35)
(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

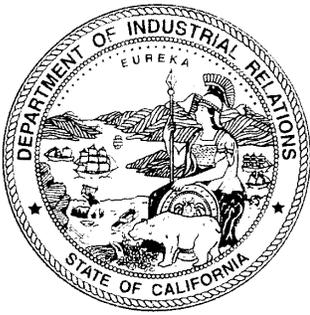
1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 30-inch diameter by 97 feet long tunnel project located under Route 99, approximately 1,300 feet north of the intersection of Route 99 and Merritt Drive Overcrossing, Traver, Tulare County.

This classification shall be conspicuously posted at the place of employment.

July 21, 2009

Date John R. Leahy
(SENIOR ENGINEER)
John R. Leahy



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C013-107-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2015 E Shields, Suite 100, Fresno, California 93726
(MAILING ADDRESS)

at ROUTE 99 IMPROVEMENTS – TULARE COUNTY (DS 36)
(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

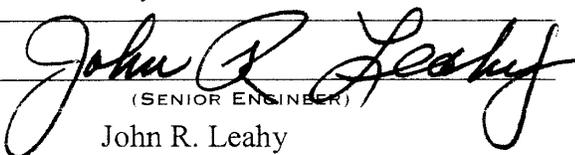
1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

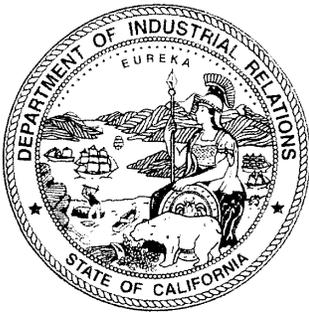
The 30-inch diameter by 73 feet long tunnel project located under Route 99, approximately 0.6 miles north of the intersection of Route 99 and Merritt Drive Overcrossing, Traver, Tulare County.

This classification shall be conspicuously posted at the place of employment.

July 21, 2009

Date


(SENIOR ENGINEER)
John R. Leahy



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C014-107-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2015 E Shields, Suite 100, Fresno, California 93726
(MAILING ADDRESS)

at ROUTE 99 IMPROVEMENTS – TULARE COUNTY (DS 41)
(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

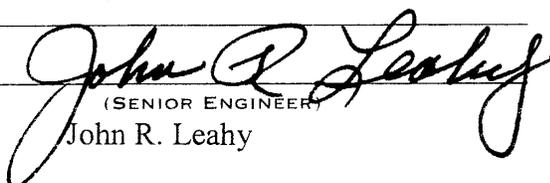
1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

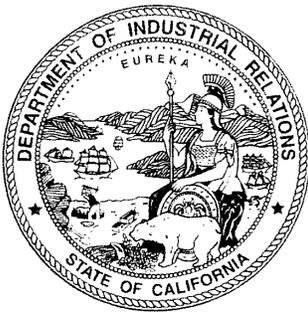
The 30-inch diameter by 26 feet long tunnel project located under Route 99, approximately 0.2 miles south of the intersection of Route 99 and Avenue 384 Overcrossing, Traver, Tulare County.

This classification shall be conspicuously posted at the place of employment.

July 21, 2009

Date


(SENIOR ENGINEER)
John R. Leahy



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C015-107-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2015 E Shields, Suite 100, Fresno, California 93726
(MAILING ADDRESS)

at ROUTE 99 IMPROVEMENTS – TULARE COUNTY (DS 43)
(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

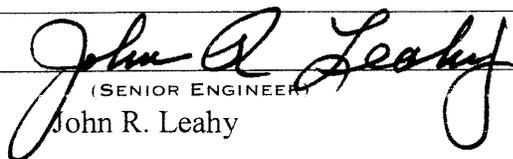
1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 30-inch diameter by 26 feet long tunnel project located under Route 99, approximately 0.2 miles north of the intersection of Route 99 and Avenue 384 Overcrossing, Traver, Tulare County.

This classification shall be conspicuously posted at the place of employment.

July 21, 2009

Date


(SENIOR ENGINEER)
John R. Leahy



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C016-107-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2015 E Shields, Suite 100, Fresno, California 93726

(MAILING ADDRESS)

at ROUTE 99 IMPROVEMENTS – TULARE COUNTY (DS 45)

(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***

(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

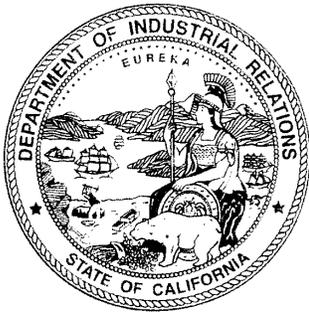
The 30-inch diameter by 233 feet long tunnel project located under Route 99, approximately 0.8 miles north of the intersection of Route 99 and Avenue 384 Overcrossing, Traver, Tulare County.

This classification shall be conspicuously posted at the place of employment.

July 21, 2009

Date


(SENIOR ENGINEER)
John R. Leahy



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C017-107-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2015 E Shields, Suite 100, Fresno, California 93726
(MAILING ADDRESS)

at ROUTE 99 IMPROVEMENTS – TULARE COUNTY (DS 62)
(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 30-inch diameter by 59 feet long tunnel project located under Route 99, approximately 2.8 miles north of the intersection of Route 99 and Avenue 384 Overcrossing, Traver, Tulare County.

This classification shall be conspicuously posted at the place of employment.

July 21, 2009

Date

John R. Leahy
(SENIOR ENGINEER)
John R. Leahy



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C018-019-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2015 E Shields, Suite 100, Fresno, California 93726
(MAILING ADDRESS)

at ROUTE 99 IMPROVEMENTS – FRESNO COUNTY (DS 63)
(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

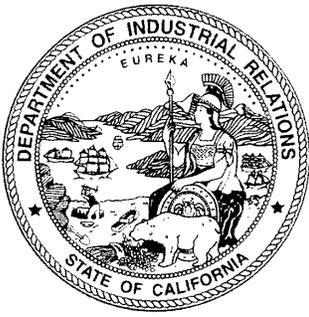
The 30-inch diameter by 59 feet long tunnel project located under Route 99, approximately 0.9 miles north of the intersection of Route 99 and Route 201, Kingsburg, Fresno County.

This classification shall be conspicuously posted at the place of employment.

July 21, 2009

Date

John R. Leahy
(SENIOR ENGINEER)
John R. Leahy



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C019-019-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2015 E Shields, Suite 100, Fresno, California 93726
(MAILING ADDRESS)

at ROUTE 99 IMPROVEMENTS – FRESNO COUNTY (DS 64)
(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

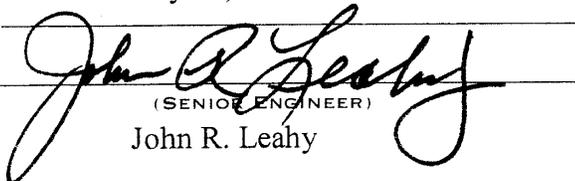
1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 30-inch diameter by 60 feet long tunnel project located under Route 99, approximately 0.8 miles north of the intersection of Route 99 and Route 201, Kingsburg, Fresno County.

This classification shall be conspicuously posted at the place of employment.

July 21, 2009

Date


(SENIOR ENGINEER)
John R. Leahy



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C021-019-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 2015 E Shields, Suite 100, Fresno, California 93726
(MAILING ADDRESS)

at ROUTE 99 IMPROVEMENTS – FRESNO COUNTY (DS 75)
(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

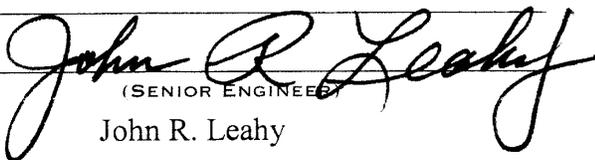
1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 30-inch diameter by 30 feet long tunnel project located under Route 99, approximately 1,000 feet north of the intersection of Route 99 and Route 201, Kingsburg, Fresno County.

This classification shall be conspicuously posted at the place of employment.

July 21, 2009

Date


(SENIOR ENGINEER)
John R. Leahy



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C022-019-10T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of _____
2015 E Shields, Suite 100, Fresno, California 93726
(MAILING ADDRESS)

at _____
ROUTE 99 IMPROVEMENTS – FRESNO COUNTY (DS 76)
(LOCATION)

has been classified as _____
*** POTENTIALLY GASSY with Special Conditions***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

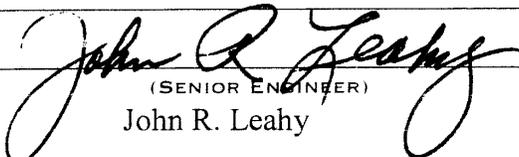
SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 30-inch diameter by 52 feet long tunnel project located under Route 99, approximately 1,000 feet north of the intersection of Route 99 and Route 201, Kingsburg, Fresno County.

This classification shall be conspicuously posted at the place of employment.

July 21, 2009

Date _____

(SENIOR ENGINEER)
John R. Leahy